RESEARCH REPORT

Evaluation of Internet Access Services for Business

INPUT

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Abstract

This report analyzes use of ISP services in the US and Europe.

ISPs (Internet service providers) face considerable challenges in meeting the changing requirements of customers, maintaining market share, and winning new business. Providers can no longer rely on basic Internet access for business. They must provide higher-value services, and at the same time commit themselves to service level agreements.

As buyers increase the scale and complexity of their Internet operations and applications, they need ISPs who can keep pace. To date, ISPs have performed reasonably well, but some aspects of ISP services (notably capacity-related issues) are beginning to lag behind user expectations.

This report identifies the current and planned use of access, hosting, and Extranet services, and measures buyer satisfaction, benefit expectations, and concerns. It covers the US, UK, France, and Germany, and the finance, manufacturing, and retail industries.

**Internet/Intranet Technologies &
Solutions Program**

**Evaluation of Internet Access Services
for Business**

Table of Contents

Appendices

List of Exhibits

Appendices
A   Vendor Awareness

B   Buyer Questionnaire

I

Introduction

A
Objectives and Scope

Most large US and European organizations (revenues of $100 million and above) have Internet access via an ISP; 90% in the US, 75% in Europe. The worldwide market for ISP services—Internet access, Web hosting, application hosting, and Extranet services—will grow at around 50% CAGR between 1997 and 2002.

These ISP services form a hierarchical chronology. In order, ISPs have, and will, include the following services into their standard offerings: Internet access, Web hosting, application hosting, Extranet services, and full commerce services. By 2002, ISPs serving the corporate market will be provide, and integrate, all these services as a minimum requirement.

This report identifies the current and planned use of access, hosting, and Extranet services. It measures buyer satisfaction, benefit expectations, and concerns.

B
Research Methodology

INPUT interviewed 150 large US and European companies (revenues of $100 million or higher) during March 1998. Countries included were the US, UK, France, and Germany. Industry sectors covered were finance, manufacturing, and retail.

EI18W 1

Exhibit I-1 shows the sample breakdown by country; Exhibit II-2 shows sample breakdown by industry sector. Exhibit I-3 shows industry sector splits within each country.

Exhibit I-1

Sample Breakdown by Country

UK
17%

US
49%

France
17%

Germany
17%
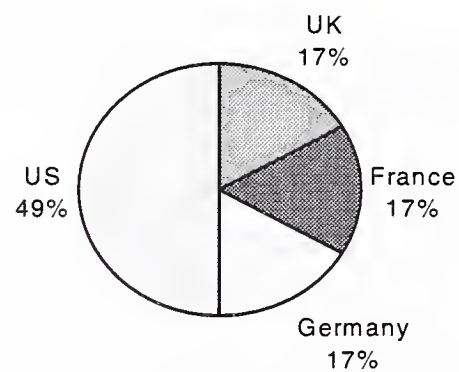
Sample: 150

Source: INPUT

Exhibit I-2

Sample Breakdown by Industry

Retail
33%

Finance
36%
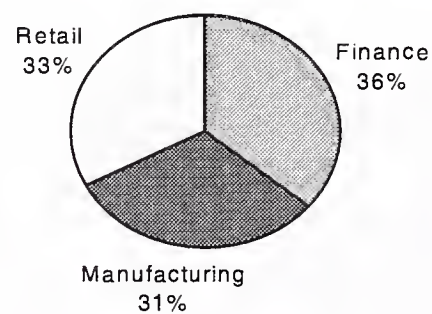
Manufacturing
31%

Sample: 150

Source: INPUT

Exhibit I-3

Sample Breakdown by Country and Industry

Country	Industry	Sample
US	Finance	26
	Manufacturing	26
	Retail	23
UK	Finance	9
	Manufacturing	7
	Retail	9
France	Finance	10
	Manufacturing	6
	Retail	9
Germany	Finance	9
	Manufacturing	8
	Retail	8

Source: INPUT

C
Report Structure

- Chapter II—Executive Summary—presents a summary of the key findings of this report, plus market forecasts.

- Chapter III—Internet Access Usage and Plans—show details of buyers' current use of access and other services, the extent of access within organizations, ISPs currently used, and service levels.

- Chapter IV—Internet Access Satisfaction and Criteria—presents a breakdown of Internet access service characteristics: their importance to buyers, and satisfaction levels

- Chapter V—Web Hosting Usage and Plans—shows current and planned use of all hosting services, server ownership options, management responsibilities, and ISP consistency

- Chapter VI—Web Hosting Benefits, Satisfaction, and Criteria—presents a breakdown of Web hosting service characteristics, their importance to buyers, and satisfaction levels, and purchasing criteria

- Chapter VII—Application Hosting Usage and Plans—shows server ownership options, management responsibilities, and ISP consistency

- Chapter VIII—Application Hosting Benefits, Satisfaction, and Criteria—presents a breakdown of Internet access service characteristics, their importance to buyers, and satisfaction levels, and purchasing criteria

- Chapter IX—Extranet Service Usage and Plans—shows current and planned use of Extranets, best VPN implementation methods, scope of deployment, and ISP consistency

- Chapter X—Extranet Benefits, Satisfaction, and Criteria—presents a breakdown of Extranet service characteristics, their importance to buyers, and satisfaction levels, purchasing criteria, and cost savings

- Appendix A shows buyers' awareness of ISPs per country

- Appendix B shows the buyer questionnaire used for this report

D
Related Reports

- *Internet and Intranet Market Analysis, Worldwide 1997-2002*

II
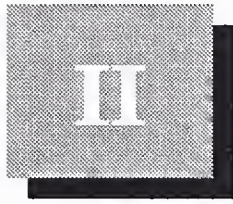
Executive Summary

A

Internet Access is a Highly-Rated Commodity, But Higher Value Services Are Keys to Future Growth

INPUT's survey reveals that Internet access is a low-margin commodity service, with buyers expressing high levels of satisfaction. However, Internet services providers, primarily ISPs and telcos, must focus on higher-value services to:

- Maintain new business growth

- Position themselves as full-service providers

- Meet the increasingly diverse needs of existing customers

The higher-value services discussed in this report which ISPs must work to integrate into their core offerings are:

- Web hosting

- Application/database hosting

- Extranet services

These are discussed separately in the following sections.

Web commerce services is the fourth category that will become a minimum requirement of ISPs, but is beyond the scope of this report.

Internet access is a commodity service. INPUT estimates that 90% of large enterprises (revenues of $100 million and above) in the US currently have a connection to the Internet via an ISP. The figure in Europe is a little lower, at 75%. A small proportion (approximately 5%) of large

companies are themselves ISP, telcos or other Internet-based network services providers, and connect direct to the Internet backbone.

INPUT's survey sample comprised large companies with an existing Internet connection, and is therefore representative of 75-90% of large US and European organizations.

As is typical for high-volume, commodity services, satisfaction levels are high. On an ascending scale of 1 to 5, organizations rate their satisfaction with their Internet access service at 4.1. There is very little difference between the countries or industry sectors covered in the survey, indicating that ISPs are providing uniformly good Internet access. Exhibit II-1 shows the ratings given by country.

Exhibit II-1

Satisfaction With Internet Access
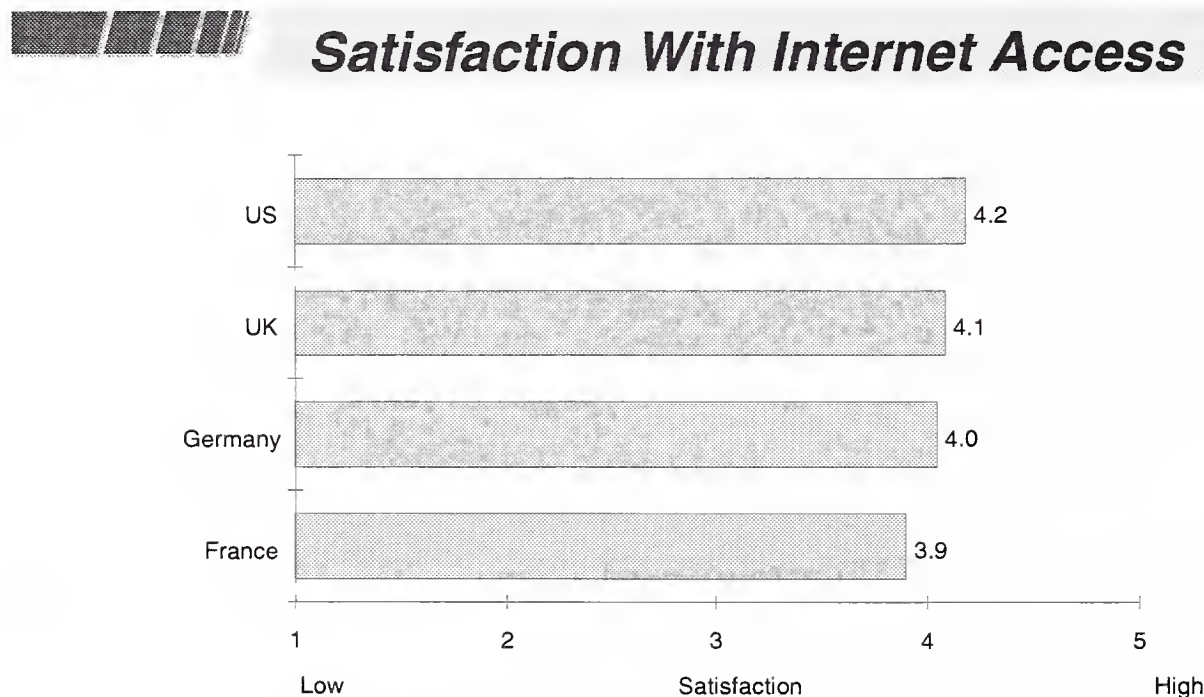
Sample: 131

Source: INPUT

Exhibit II-2 shows satisfaction plotted against importance of several characteristics of Internet access services. The black circle shows current importance; the white circle shows expected importance in two years'

EI18W

time. Characteristics towards the top-right corner are important *and* meet with buyers' satisfaction. National coverage and reliability, therefore, are both important aspects of Internet access that ISPs are providing to a high level currently.

Characteristics towards the bottom-right corner are important, but *not* provided to a high standard currently. For example, buyers are relatively dissatisfied with their ISP's apparent commitment to upgrade and improve service. At current satisfaction levels, quality of backbone architecture is a problem area; its importance to users will rise significantly over the next two years, and it is only considered adequate by users currently.

As corporate buyers seek to connect an increasing proportion of their worldwide operations to the Internet, and to each other, the solidity and performance of the underlying backbone become critical. Many companies, even large enterprises, connect to the Internet through sub-capacity connections. Low-bandwidth dialup connections are not uncommon even in large organizations, particularly those fragmented geographically such as retailers.

The quality of every service an ISP offers depends on that ISP's connections to the rest of the Internet. High bandwidth backbone connections are not adequate to provide a robust service. Peering arrangements with other ISPs, redundancy of equipment, lines, and power at PoPs (points of presence) and NAPs (network access points), and high-quality management are critical to ensure good service.

Exhibit II-2

Performance of Most Important Internet Access Characteristics

Internet Access Services

High

●—○ National coverage

●—○ Reliability

●●○ Service continuity

Satisfaction

●———○ Backbone architecture

●—○ Commitment to improve

Low

Low　　　Importance　　　High

INPUT*

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Sample: 121

Source: INPUT
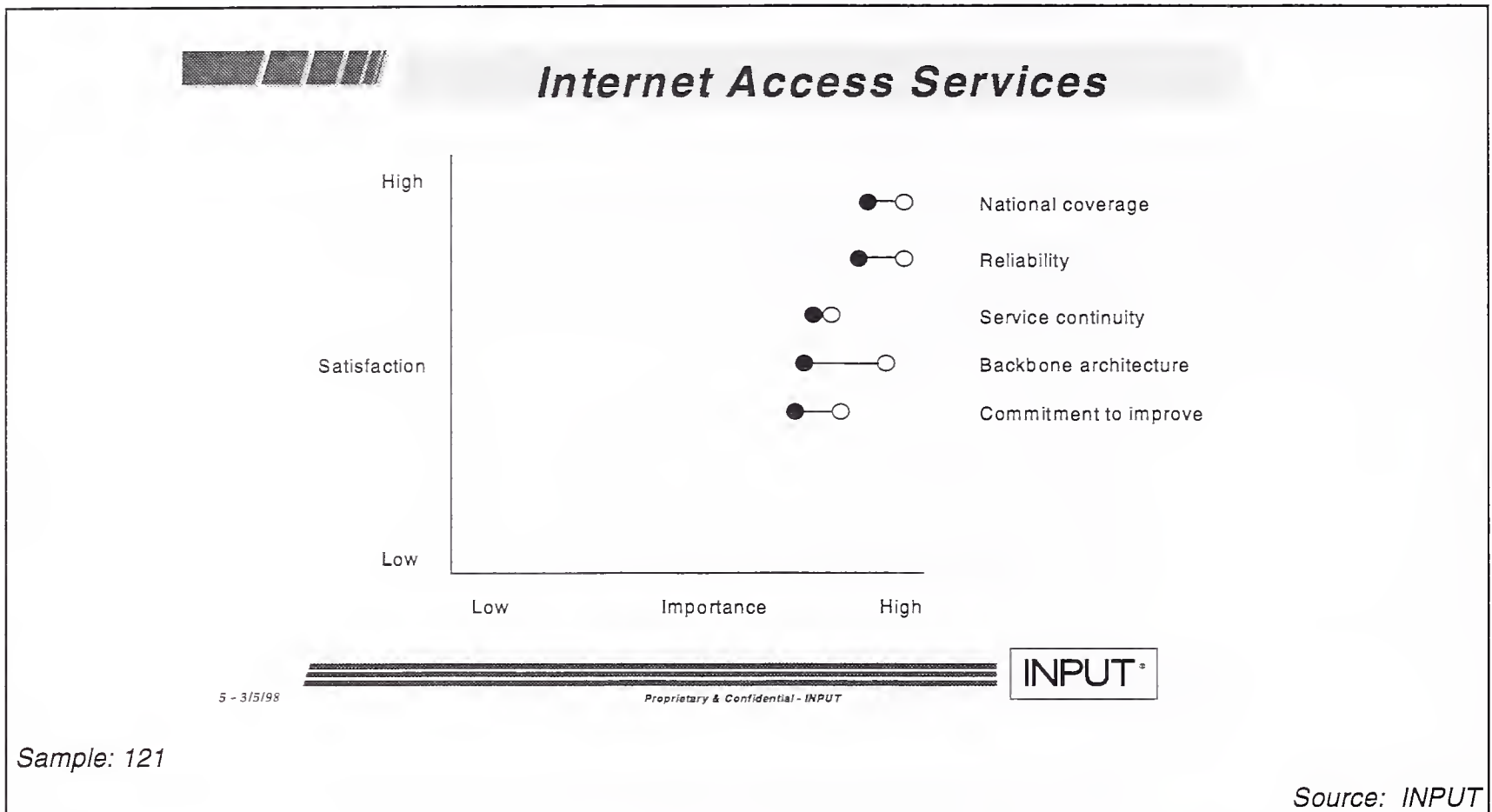
The Exhibit shows the most important characteristics. Other aspects, while of lower importance, will experience a similarly significant relative rise. For example, currently, European organizations place more importance on international coverage than do US companies. US organizations are extending their Internet operations overseas rapidly, and they account for most of the increase in importance of international coverage over the next two years. This is the most significant difference between US and European buyers; European respondents rated the importance of international coverage at 3.3 out of 5, US respondents at only 2.2.

But growth in the large company Internet access market does not depend only on identifying changing buyer requirements. There is considerable room for growth supplying basic access to employees that currently have no access. Exhibit II-3 shows the proportions of employees that currently have email and Web access among companies surveyed. The opportunities for ISPs are in providing higher capacity connections, extensive implementation services to serve an increasing user base within

individual companies, and increasing revenue through traffic volume-based pricing models.

In a typical US organization interviewed, half the employees have Web access; in Europe, a quarter. In France, the figure drops to just 17%.

Among US respondents, one third gave email access to 100% of staff; in Europe one quarter did. Company-wide Web access was seen in only 10% of US and European companies.

Exhibit II-3

Extent of Internet Access Among Employees

Extent of Internet Access Among Employees

US — 64%, 48%
Europe — 48%, 23%

Legend: Email, Web

Proportion of Employees (0% to 70%)
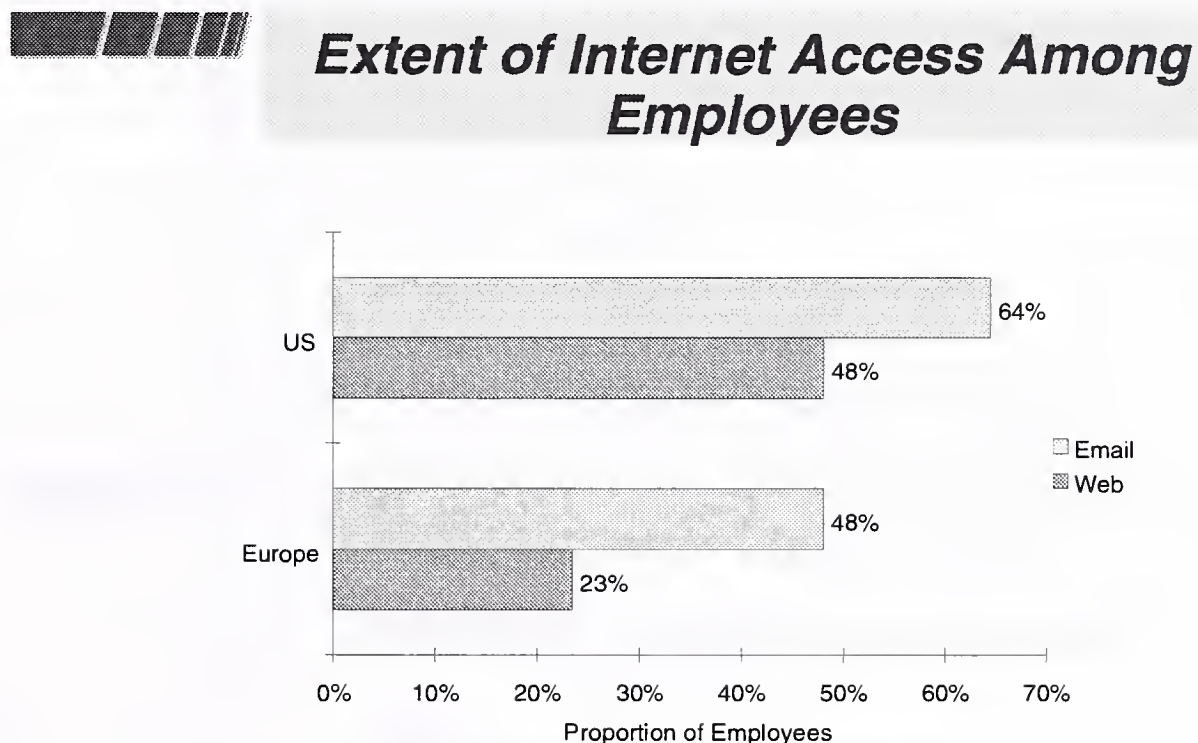
5 - 3/5/98   Proprietary & Confidential - INPUT   INPUT®

Sample: 145

Source: INPUT

While the need for ISPs to offer the highest quality access services and continually perfect the underlying network architecture is paramount, strategic focus must be put on higher value services. ISPs cannot compete on access alone, and buyers are requiring an increasingly broad range of additional services. Exhibit II-4 shows the minimum services that a corporate ISP must offer to be able to bid for business. Many ISPs offer these services ahead of time as marked in the Exhibit—buyers can expect

to conduct Internet commerce with many ISPs today, for example, but the ISP may be restricted to the provision of a secure server and rudimentary credit card handling. Full, integrated commerce services that support all major payment mechanisms and provide service guarantees are rarer, and not yet an absolute requirement for an ISP to succeed in the market.

Exhibit II-4

Minimum ISP Services

Source: INPUT
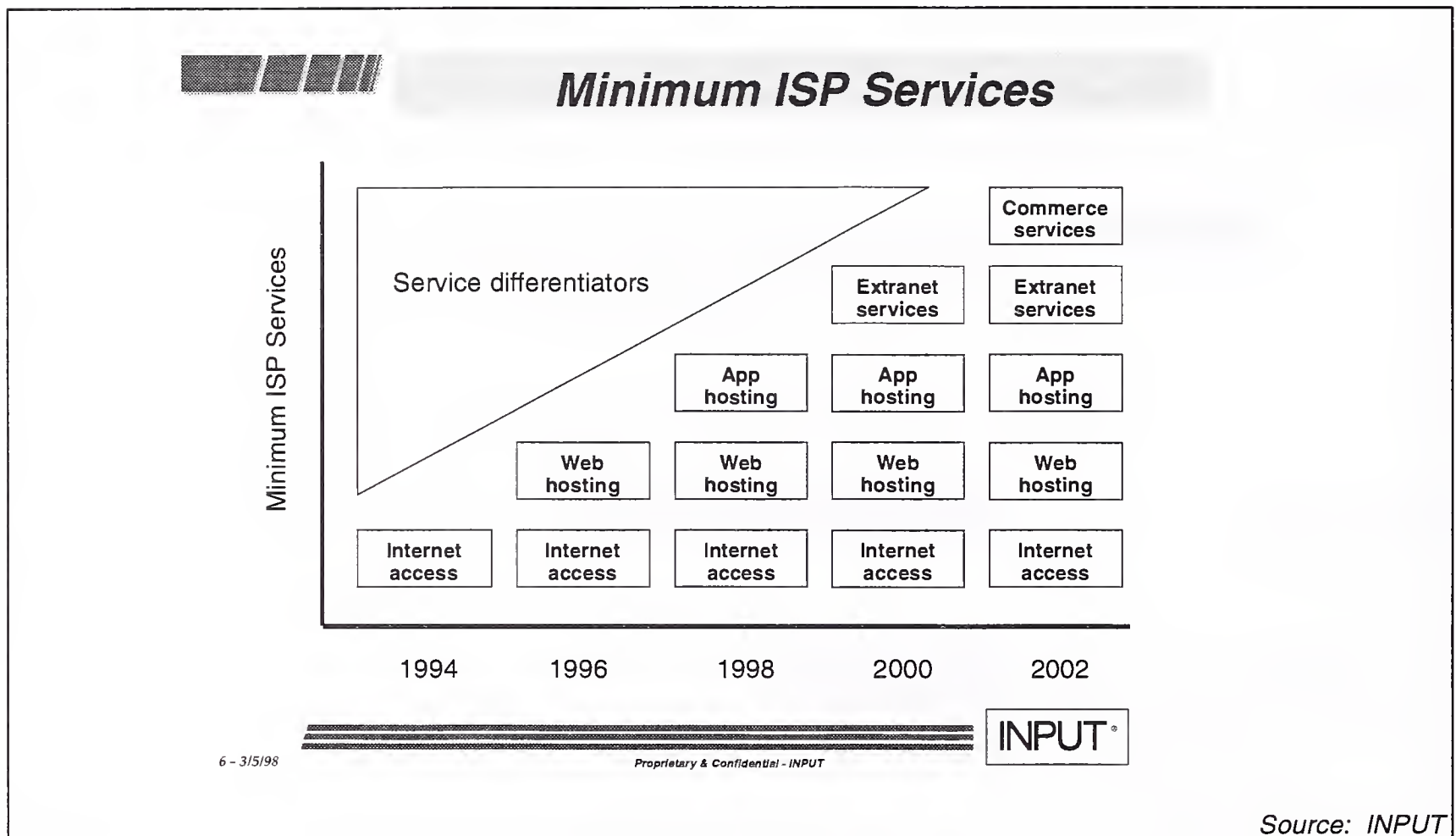
Internet access is decreasing as a proportion of ISP revenues. Service offerings required of ISPs are increasing in number and variety and include Web hosting, private application, Intranet and database hosting, Extranet provision, and Internet commerce. Further, buyers are looking to shift greater management responsibility to their ISP, and an increasing number are seeking fully-managed services.

The requirements within service offerings are growing. Web hosting services must include not only the operation and management of a Web server, but also content duplication and mirroring, load balancing, site advertising management, credit card processing, and visitor tracking and profiling, alongside being responsive to short-term changes in customer

needs. Auxiliary services such as Web site planning and design and Web marketing consultancy are become increasingly important in the SME sector.

Exhibit II-5 shows the current and expected usage of ISP services.

US and European organizations expect to make similar use of Web server hosting, application hosting, and Extranet services by 2000. However, European respondents exhibited only half the level of usage of application hosting and Extranet services as US respondents, indicating particularly strong growth in Europe in these areas.

Among the industry sectors covered in this report, finance and manufacturing exhibited similar current and future service usage levels, but the retail industry lagged behind significantly in use of application hosting and Extranet services. By 2000, the retail industry expects to make comparatively very high use of Web hosting, but still low use of ISPs' Extranet offerings.

Exhibit II-5

Current and Expected Use of ISP Services

Use of ISP Services

Sample: 150

Source: INPUT
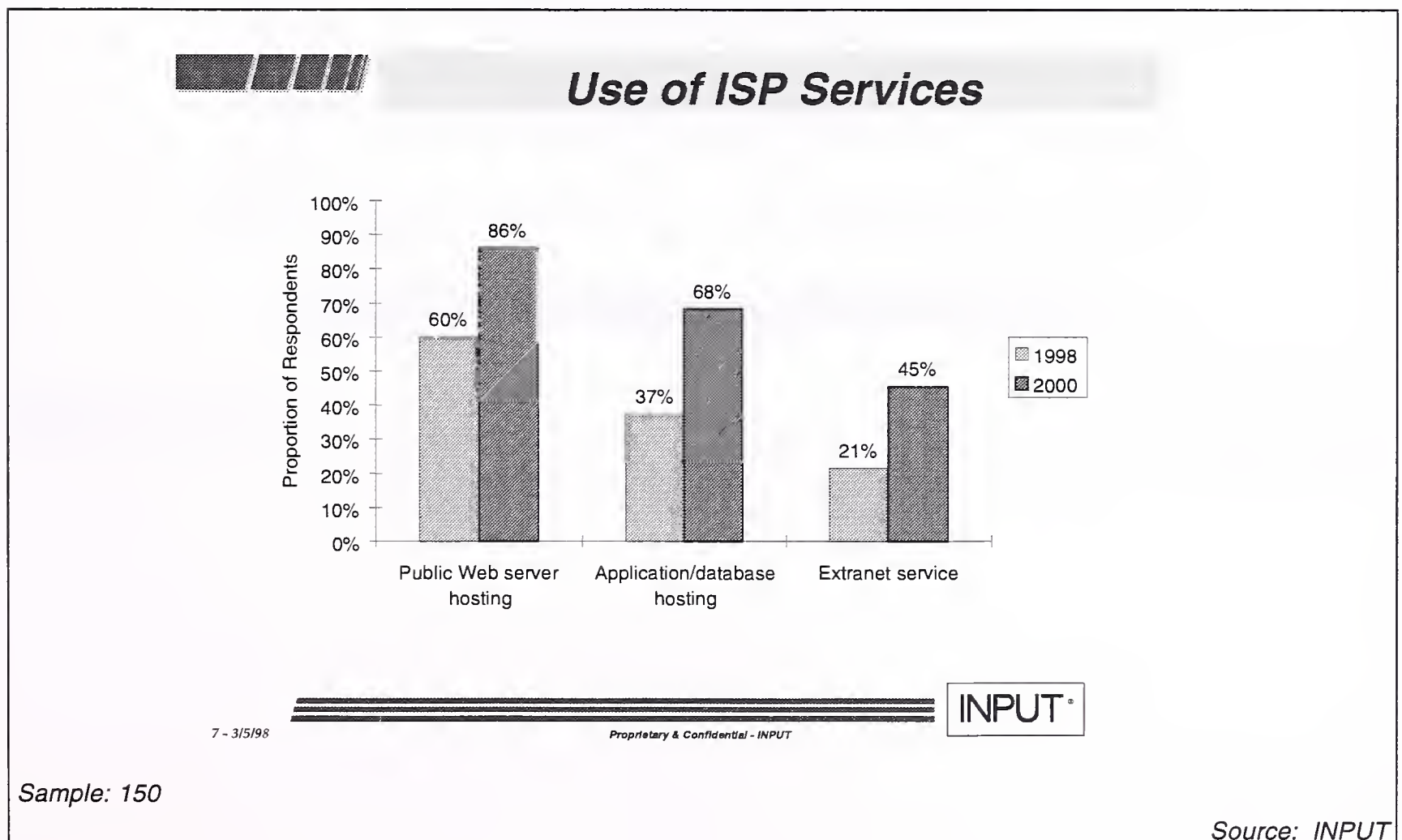
Although buyers are satisfied with their Internet access service, higher value services are not performing equally well. Exhibit II-6 shows the overall satisfaction rating given to each service. Due to the speed of growth in the Internet services market and the increasing range of buyer requirements, ISPs positioning themselves in the enterprise market must provide high-quality service in all these areas.

Exhibit II-6

Satisfaction With ISP Services, Worldwide

Satisfaction With ISP Services, Worldwide

Service	Satisfaction	Sample
Internet access	4.1	(131)
Application hosting	3.6	(48)
Web hosting	3.4	(78)
Extranet services	3.4	(18)

1   2   3   4   5
Low   Satisfaction   High
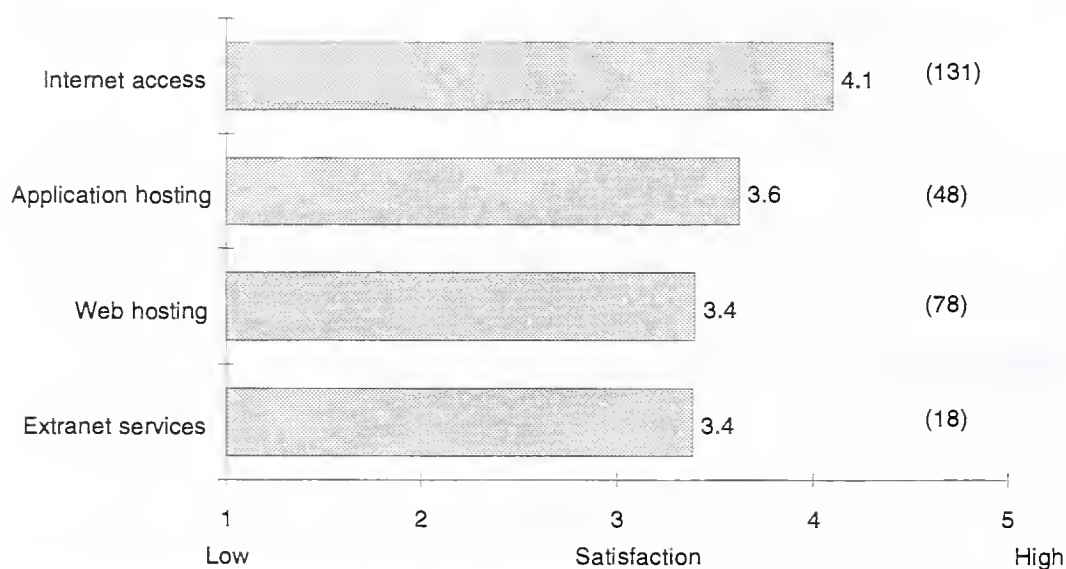
1 - 3/5/98   Proprietary & Confidential - INPUT   INPUT

Sample: shown individually

Source: INPUT

Exhibit II-7 shows which ISPs in each country have highest visibility in the market for corporate Internet services. Respondents were asked to indicate which ISPs they considered credible suppliers of high-quality Internet access and related services (hosting and Extranet services). In all countries but the UK, one or more telcos were most often perceived as credible providers. IBM, AT&T, and Compuserve had high visibility across all countries (Compuserve only narrowly missed inclusion among the top vendors in the US), indicating their strong international presence.

Exhibit II-7

Vendor Awareness

Vendor Awareness

US	
AT&T	85%
IBM	72%
GT-BBN, ANS	65%

UK	
IBM	88%
Compuserve	80%
BT, AT&T	68%

France	
France Telecom	96%
IBM	84%
CS, Cegetel, AT&T	68%

Germany	
Deutsche Telekom	84%
AT&T	80%
CS, IBM, UUNET	72%

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Sample: US: 75; others: 25
Note: CS = Compuserve

Source: INPUT

Exhibit II-8 shows current and future expenditure on Internet access, worldwide. Growth rates over the next five years are lower for Internet access than for most other sectors of the Internet/Intranet market. This is due to:

- Comparatively high starting base compared with newer services such as hosting and Extranet services

- Subsequent greater proximity to market saturation

- Falling prices due to the commoditization of Internet access

- More limited opportunities to generate additional business from existing customers; hosting services can be sold several times to a company, Internet access cannot to the same level

Exhibit II-8

Internet Access Expenditure, Worldwide, 1998-2003

Internet Access Expenditure, 1998-2003

CAGR: 22%

11

29

Market Size ($B)

1998   2003
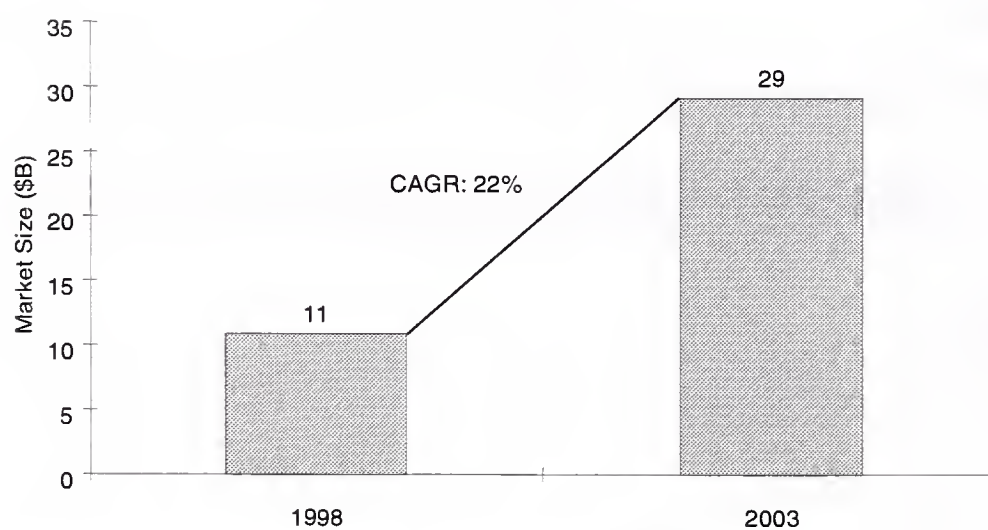
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Source: INPUT

B
Web Hosting

The Web hosting market is well established, yet is in constant change. As publicly available Web sites become more sophisticated, they require a greater degree of server intelligence. As a result, Web hosting and application hosting services are providing increasingly similar capabilities.

Quality of service is becoming a prime differentiator of Web hosting services during 1998, with several leading hosting vendors committing to published service levels. Examples include Exodus, ANS, and PSInet, which have all set guarantees at 99.5% or higher. From 1998, service levels will be a requirement of all corporate ISP services, from access to hosting and Extranet services. ISPs that do not respond to this trend will find it increasingly difficult to compete, yet providing service guarantees of 99.5% and above is a considerable challenge. Providers that own the largest infrastructures will find it easiest to guarantee service, leaving small independent and reseller ISPs at a disadvantage.

Unlike Internet access, buyers are only moderately satisfied with the Web hosting services they receive, rating them at 3.4 out of 5 overall. Exhibit II-9 shows importance of and satisfaction with the elements of Web hosting services considered most important.

The highest performing characteristic among both US and European organizations is reliability/uptime, but security issues are currently the most important to buyers. Physical security is rated only moderately, however.

Two issues of very high future importance are scalability and server bandwidth, reflecting the increasingly ambitious and demanding nature of corporate Web sites. Currently, however, buyers are relatively dissatisfied with these aspect of Web hosting services, and ISPs are encouraged to address these and related capacity issues.

Exhibit II-9

Performance of Most Important Web Hosting Characteristics

Web Hosting Services

High

Satisfaction

Low

Low   Importance   High

Reliability

Application/data security

Service continuity
Physical security

Scalability
Server bandwidth

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Sample: 90

Source: INPUT
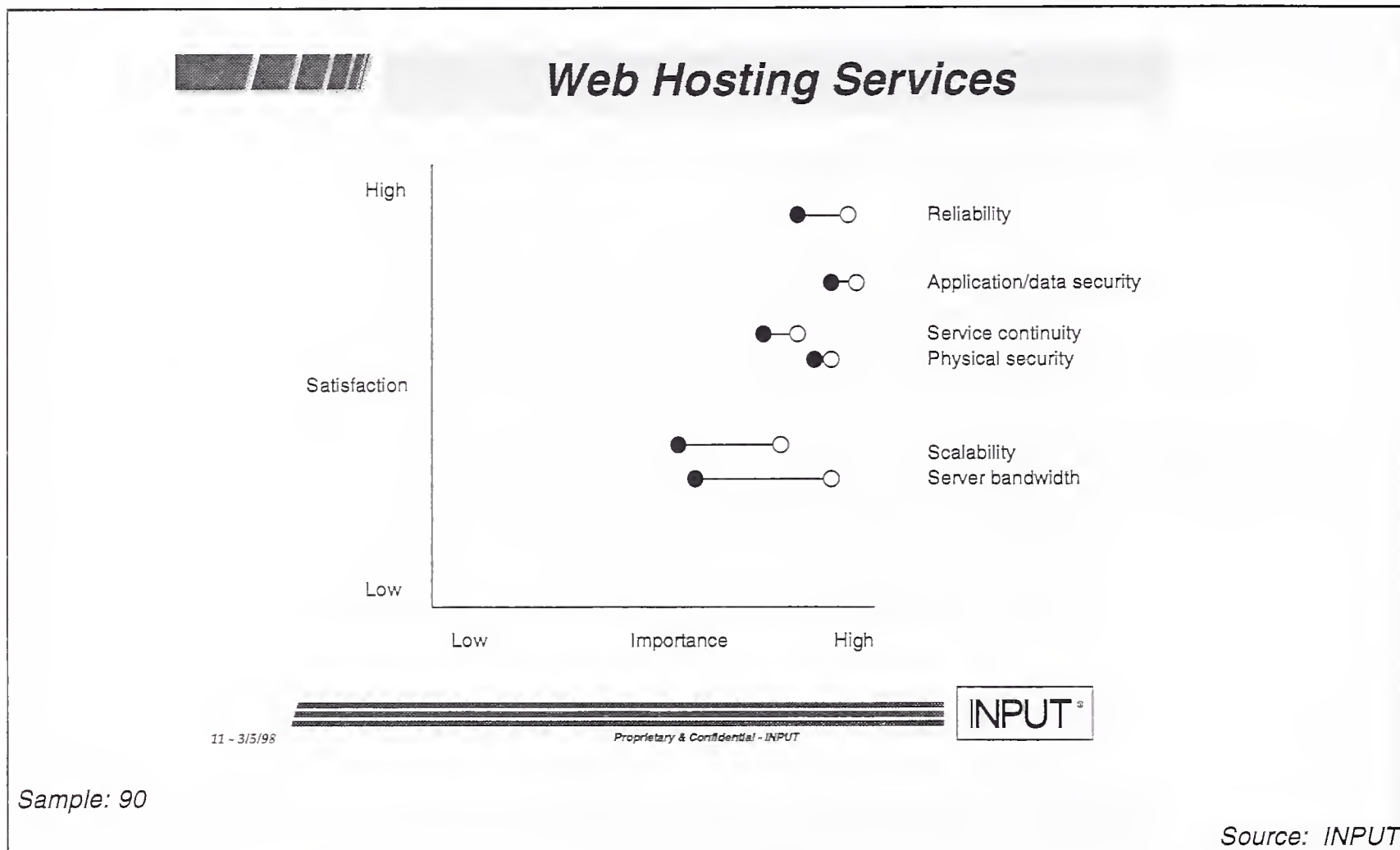
Exhibit II-10 shows expenditure on hosting services (both Web and application hosting) worldwide.

Exhibit II-10

Hosting Expenditure, Worldwide, 1998-2003

Hosting Services Expenditure, 1998-2003

CAGR: 47%

6 — 1998

44 — 2003

Market Size ($B)

INPUT

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Source: INPUT
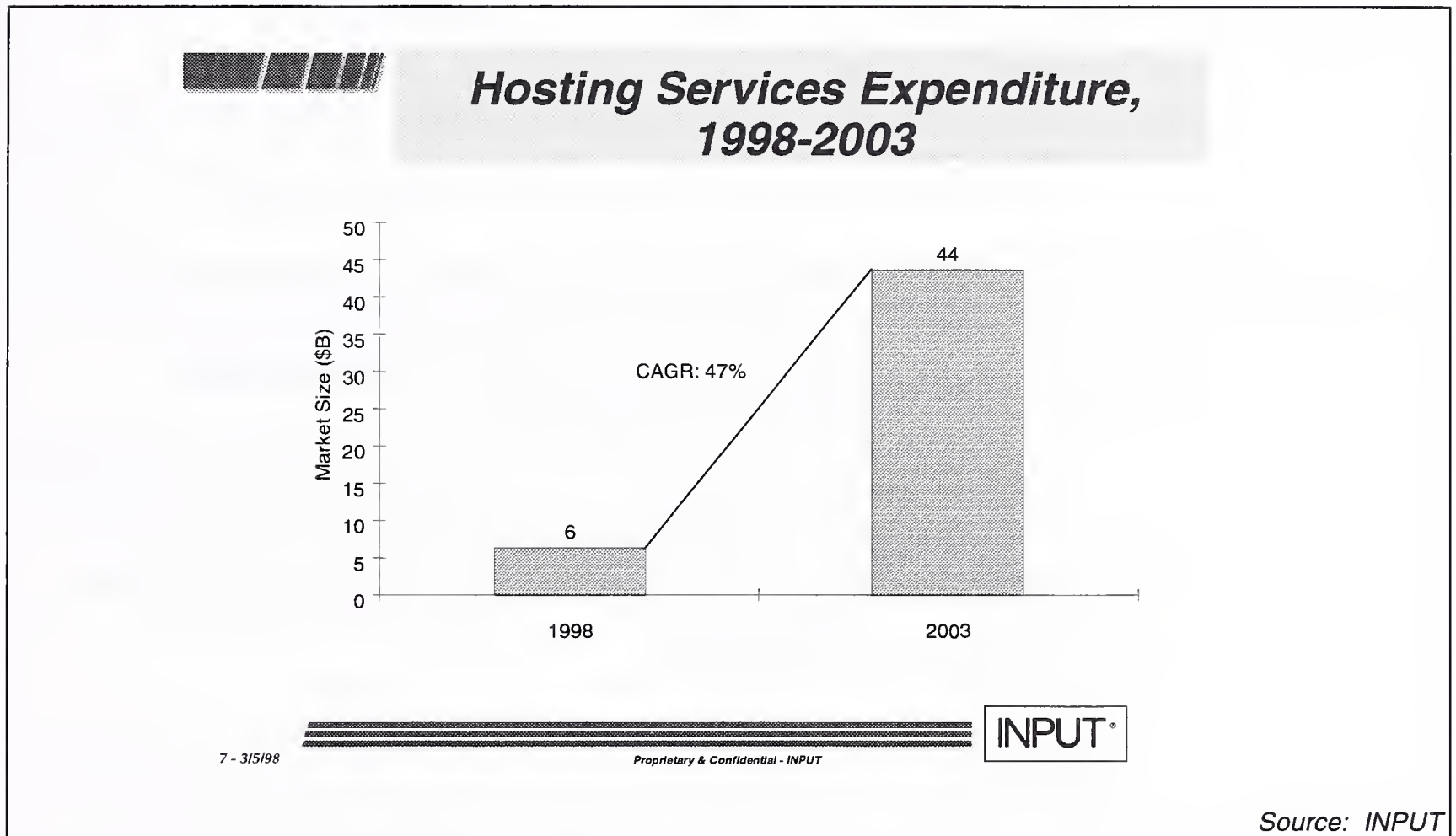
C

Application Hosting

Application hosting is defined as the remote siting and operation of a dedicated process-based application. INPUT considers server-side CGI applications as a standard component of a Web hosting service, and they are not included here.

Early examples of remotely ISP-hosted applications are groupware, remotely shared workspaces, and low-end database applications. However, the greatest opportunity for ISPs is the hosting of enterprise and otherwise mission-critical applications.

Application hosting providers comprise a diverse range of providers including major ISPs, telcos, and specialist hosting companies not competing in the crowded Internet access market. They include:

- NaviSite provides remote access to enterprise applications such as SAP, Baan, and Oracle. Navisite acquired the application integrator Servercast, and in doing so gained access to its customers who previously used Exodus and Frontier GlobalCenter for application hosting.

- PSInet and Hewlett-Packard have partnered to promote PSInet's hosting services, based on HP systems. Hewlett-Packard is marketing the hosting service through its extensive reseller channel.

- USinternetworking is integrating enterprise applications including Oracle, PeopleSoft, and Baan into its Web hosting service and is developing a monthly application rental scheme.

- Sage Networks' Enterprise Solutions Group is building its US hosting business through an aggressive acquisition policy (including Tri Star Web Creations, Clever Internet Services, DirectNet, and an IBM hosting site). Sage is offering Lotus Notes/Domino-based knowledge management application hosting through a partnership with KnowledgeLink Interactive.

Exhibit II-11 shows the importance given to characteristics of application hosting services, expected future importance, and buyers' satisfaction levels. Buyers are very highly satisfied with the reliability of their application hosting service, particularly when satisfaction is compared with importance.

As with Web hosting, security is the most important issue overall, and is rated reasonably highly. Also as seen with Web hosting services, server bandwidth and scalability are issues expected to increase considerably in importance over the next two years, yet are currently rated only medium for satisfaction. The sharply increasing importance put on server bandwidth suggests that ISPs should offer dedicated, reserved bandwidth quotas on a per-server basis as a standard component of a hosting service. Buyers expect predictable performance levels from application servers, and currently this is not being provided adequately.

The bandwidth available to the server is directly related to the traffic demands of the application being run and the number of concurrent users. As both increase, scalability of the server becomes critical, and this is the second area that will rise in importance significantly over the next two years.

Buyers expect the applications they run on hosted servers to increase in size, complexity, and user population. As organizations progress through the cycle of trial and small-scale projects, their needs increase until they move one or more mission-critical applications onto a hosting site. At that point, reliability, availability, scalability, and security are non-negotiable factors.

Exhibit II-11

Performance of Most Important Application Hosting Characteristics

Sample: 77

Source: INPUT
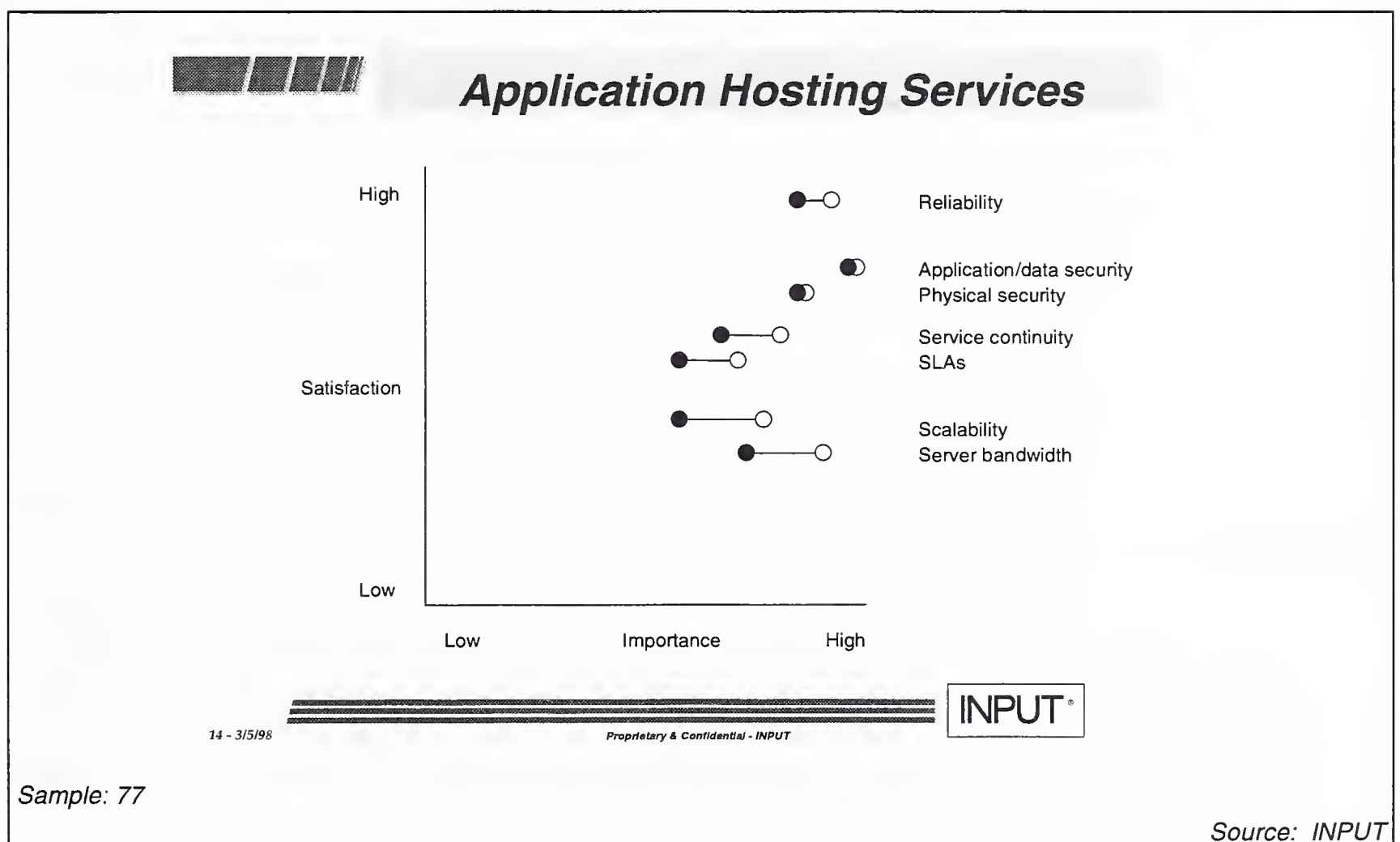
See Exhibit II-10 for a forecast of the hosting market.

D

Extranet Services

Unlike the other ISP services discussed in this report—Internet access, Web hosting, and application hosting—an Extranet can be achieved by an organization without the use of a dedicated ISP service. To connect two or

more organizations' Intranets, a basic Extranet can be implemented using only an ISP's Internet access service.

In-house, product-based Extranets can be developed using technology from a diverse range of companies, including Cisco, Secure Computing, Netscape, IBM, and Bay Networks. For example, Ford Motor Company's Extranet was developed using Netscape servers, notably Directory Server, to connect to its suppliers worldwide; its Extranet directory contains 200,000 employees and resources.

As with all Internet services, Extranet quality guarantees are rapidly becoming a critical competitive tool. UUNET has set an end-to-end service guarantee on its Extralink Extranet service of 99.9%, with substantial discounts for failures to meet service levels. Providers entering the Extranet market from a background of VPN and VAN services must apply the same standards to Internet services as they do to proprietary services.

The elements of ISP-provided Extranet services considered most important, now and in two years, are shown in Exhibit II-12.

Two characteristics not shown in the Exhibit are expected to grow in importance particularly rapidly: international coverage and directory services. International coverage is currently considered the least important aspect by US respondents, but as US organizations extend their core Internet and Intranet operations to Europe and Asia Pacific, they expect ISPs to keep pace. As mentioned above, Ford Motor Company based its wide-ranging Extranet largely on Netscape's Directory Server. Ford has a history of pioneering Internet-based technology—it provided one of the first widely publicized cases of a large-scale corporate Intranet—and its Extranet implementation shows the future importance of directory services.

Most of the future important characteristics are already considered important. Unlike most issues, Internet tunneling (the process of creating a secured route through the Internet for private, encrypted traffic) will change in status, from 'reasonably important' to 'very important', as organizations demand higher levels of security due to the increasingly mission-critical nature of their Internet usage.

Exhibit II-12

Change in Importance of Most Significant Extranet Characteristics

Most Important Extranet Characteristics

Characteristic	Importance 1998	2000
1. National coverage	4.8	4.9
2. Reliability	4.7	4.8
3. Internet tunneling	3.8	4.2
4. Remote Intranet access	4.2	4.2

Biggest change

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Sample: 48

Source: INPUT

Exhibit II-13 shows current and future expenditure on ISP Extranet services. Of all the sectors covered in this report, Extranet services will show the highest growth by value over the next five years. This is due partly to the lower starting base compared with Internet access and hosting services, and potentially high pricing.

Growth in the Extranet market will also be driven by Metcalfe's Law, which states that the value of a network is proportional to the square of the nodes connected to it. This value-based growth in networks and network-based devices is exponential. Each new adopter increases the value of the whole network, thus making the network more attractive to the next adopter, thus speeding growth. Very high growth rates are common in such a model; historic examples include the Internet itself, telephones, and fax machines.

Exhibit II-13

Extranet Service Expenditure, Worldwide, 1998-2003

*Extranet Services Expenditure,
1998-2003*

CAGR: 107%

Source: INPUT
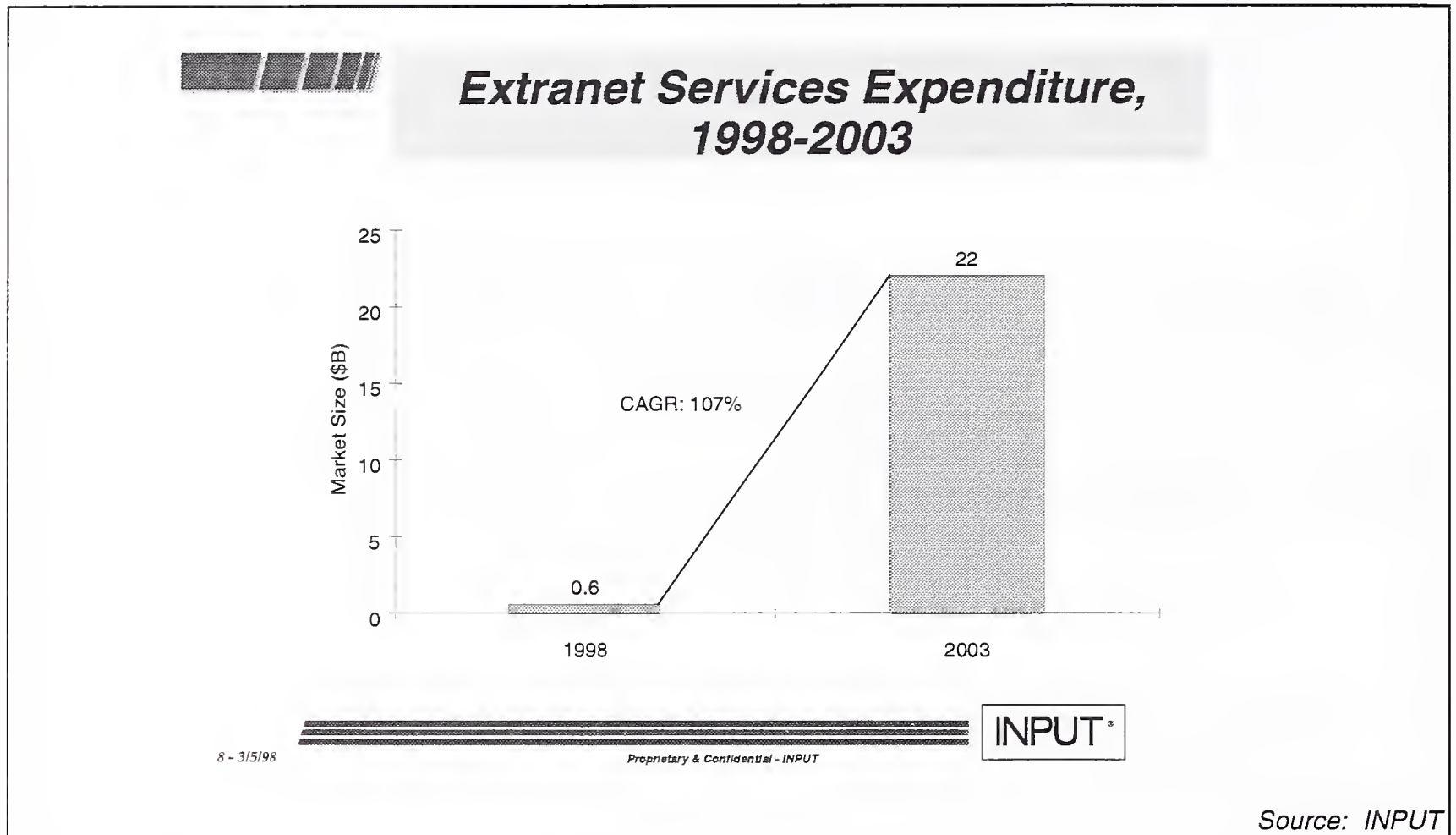
E

The Future of the ISP Market

The ISP market is volatile and is changing rapidly from a carrier market to an applications and services market. Many aspects of the market will take part in shaping it over the next few years, including increasingly demanding enterprise needs, emerging technologies, and an increase in commerce activity. This section discusses two such aspects: application rental and market consolidation.

1. Application Rental

Application rental is one step beyond application hosting. It requires the supplier to take a proactive, sales-driven approach as opposed to the more passive technology-based approach of an infrastructure provider.

Opportunities will become more numerous in the rental than in the hosting market, although unit sales will be lower. Buyers will use rental services to:

- Trial an application before purchase of the product and/or related hosting service

- Gain access to applications previously out of reach due to lack of budget or required infrastructure

- Provide access to non-critical applications for specialist staff otherwise too few in number to justify in-house implementation

- Cut costs, paying only for the functions they use and only for the time they use them

- Retain the option to change application without complex internal upgrades

As mentioned above under "Application Hosting", several hosting companies are looking to rental both as a revenue generator and as a service differentiator. Groupware and enterprise applications are early examples of rentable applications, and the variety will increase.

Beyond rental, several major ISPs, network services vendors, telcos, and outsourcers are working towards full utility services. The analogy of power utilities providing service via a national grid is a common one, and is becoming a more suitable model for the provision of IT as technology management increases in sophistication, remote hardware and software management becomes a commonplace, and the Internet continues to pervade as the common medium for electronic services. The full utility market is beyond the scope of this report, however, and will be analyzed in depth in a future INPUT project.

Several application and application-enabling technology vendors are aligning their products with the emerging rental market. For example, Lotus released Domino Instant Host in March 1998. Domino Instant Host

resides between a Domino application and the underlying system; it tracks Domino application usage and enables users to be billed accordingly. ISPs can use it to provide limited or full access to Domino-based applications in a flexible service offering.

The target is SMEs that do not have a Notes/Domino infrastructure or the in-house IT capability to support such an infrastructure. Large companies building Extranets are also targeted that want to keep external users away from their corporate network but still retain Extranet functionality.

At the time of the Domino Instant Host released, several ISPs announced their intention to provide an application rental service based on it. These included BT, France Telecom, Netcom, and America Online.

Another company developing application rental technology is Changepoint. Changepoint's involv Team Intranet product provides a remotely-hosted Intranet for users who set up and manage the environment via the Internet. Groupware applications such as project management, discussion forums and calendaring are provided within the service. Per-user are low—on a par with an individual ISP dialup account.

Rented applications are particularly well suited to contract and freelance workers, grouped temporarily, who need to organize projects with disparate co-workers and who do not necessarily have permanent access to a corporate IT infrastructure.

Other companies providing rental services and not discussed so far include:

- Throw—has developed a "private space" rental service for consumers

- Epicon—provides a Windows application rental service

- Intermark—rents applications by time, down to the minute

2. Market Consolidation

Much has been reported of the consolidation of the ISP market. Similar to many Internet-related predictions such as ubiquitous commerce mechanisms, it has yet to happen. The number of small, independent ISPs continues to rise, not shrink, both in the US and Europe.

INPUT believes that ISP consolidation will happen and that in fact it is happening now. INPUT's report *Internet/Intranet Market Forecast, 1997-*

2002 predicted that the leading suppliers of Extranet services by 2002 will be:

- "Telcos currently engaged in mergers and acquisitions in preparation for the future Internet-based voice/data services market, such as Worldcom and AT&T.

- Consortia and joint ventures between existing network services providers and telcos, such as Global One and Concert.

- Major ISPs and network services providers who position themselves to offer voice and data services over the Internet differentiated from other ISPs by quality of service guarantees, global coverage, and breadth of wireless and fixed access, such as Infonet and Equant."

The report also concluded that "the Internet access market will consolidate between 1997 and 2002, with telcos taking the majority share through competitive offerings, integrated phone/Internet services and billing, and acquisition".

Merger and acquisition activity in the ISP market has continued at a high level since that report was published, and in this report we have seen that service guarantees and global coverage are of high importance. The list of suppliers above can also be applied to ISPs providing other corporate services.

Evidence of ISP market consolidation comes from the many acquisitions made over the past two years. Worldcom has proved the highest-profile acquirer, counting among its acquisitions MFS Communications (thereby also UUNET), MCI, Compuserve, AOL ANS, and Dutch ISP NLnet. A by-product of this activity is Cable & Wireless' increased standing in the ISP market through its acquisition of MCI's Internet business, a result of US and European concerns over Worldcom's potential monopoly status.

INPUT believes that Internet access will become a commonplace on a par with the telephone and postal systems. The best-placed companies to provide such ubiquitous service are de facto utilities. Despite the ongoing fragmentation of national telephone and postal services whereby state providers are opened to competition to private suppliers, on a global level this fragmentation is encouraging consolidation—multinational organizations are controlling a greater number of national providers.

The same will happen in the Internet access market, particularly in the residential sector. Customers will connect to, and be billed by a regional or national company which will be part of a larger, multinational group.

III
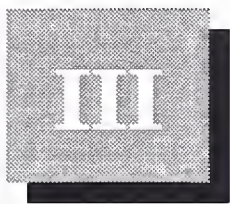
Internet Access Usage and Plans

A
Current and Future Usage

Exhibit III-1 shows the current and expected use of ISP services—Web server hosting, application hosting, and Extranet services.

Planned service usage is similar across the US and Europe (Exhibits III-2 and III-3), but levels of application hosting and Extranet service usage in Europe are currently around half the US level. Growth rates for these services will be strongest in Europe, therefore.

Exhibits III-4 to III-6 show usage by industry sector. Finance and manufacturing show similar current and future usage levels, but the retail industry lags behind significantly in use of application hosting and Extranet services. By 2000, the retail industry expects to make comparatively very high use of Web hosting, but still low use of ISPs' Extranet offerings.

Exhibit III-1

Current and Expected Use of ISP Services, 1998-2000, Worldwide
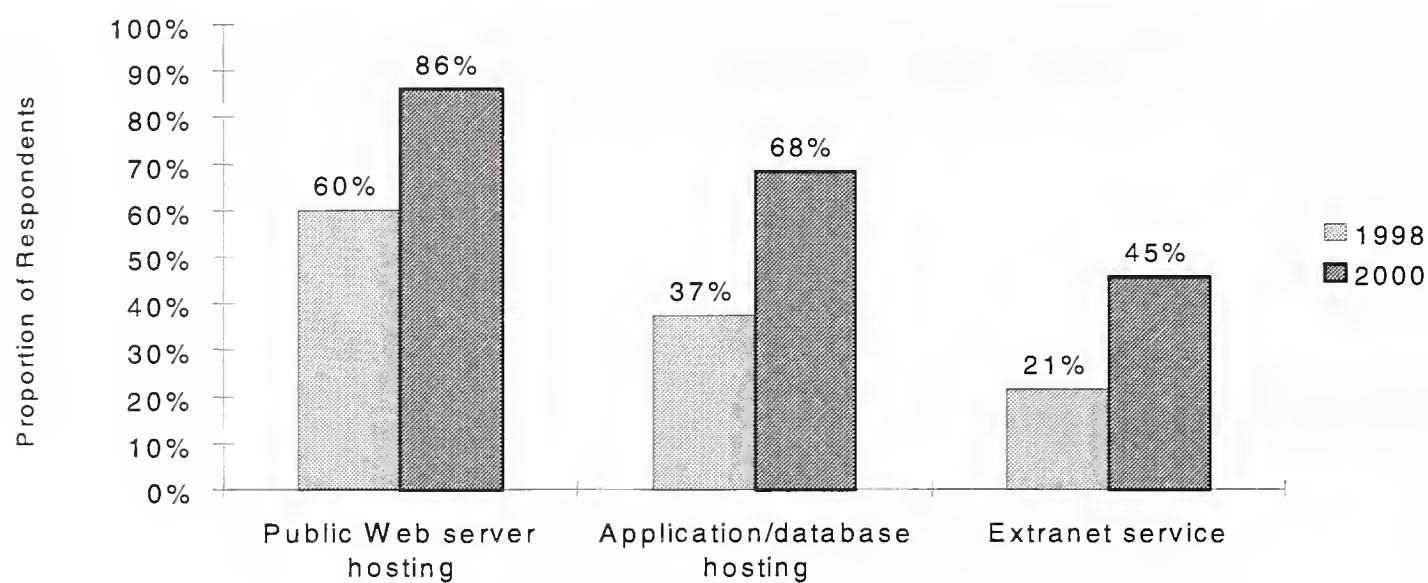
Sample: 150

Source: INPUT

Exhibit III-2

Current and Expected Use of ISP Services, 1998-2000, US
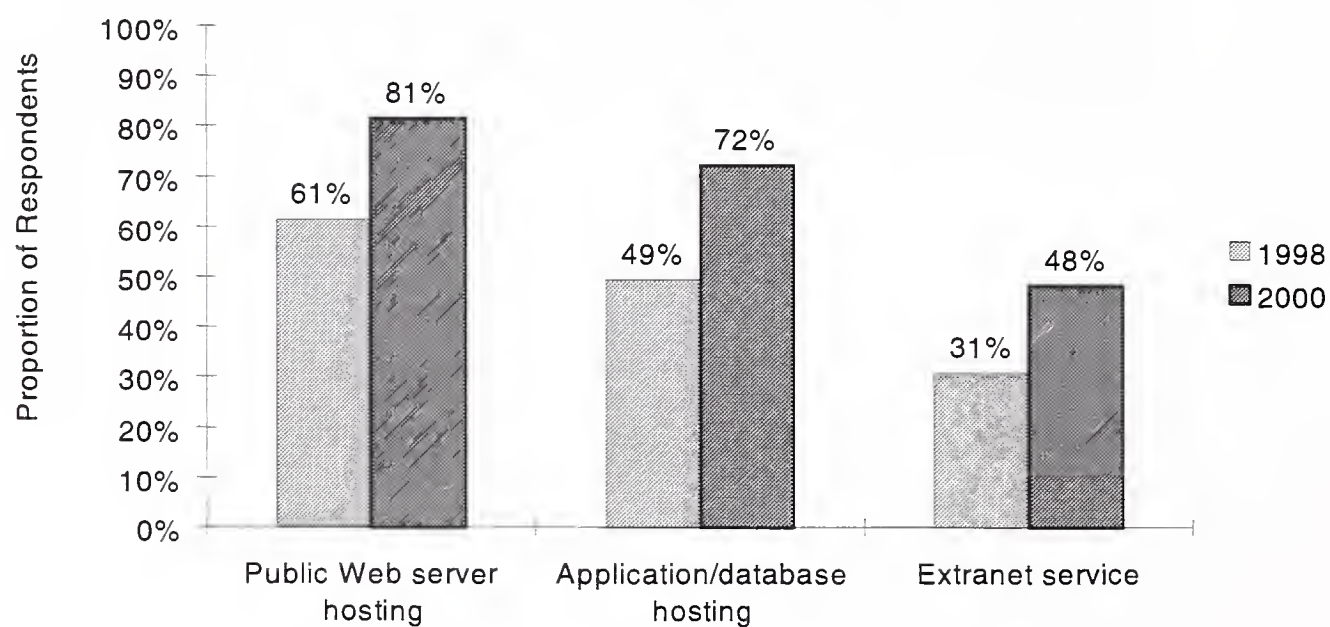
Sample: 75

Source: INPUT

Exhibit III-3

Current and Expected Use of ISP Services, 1998-2000, Europe
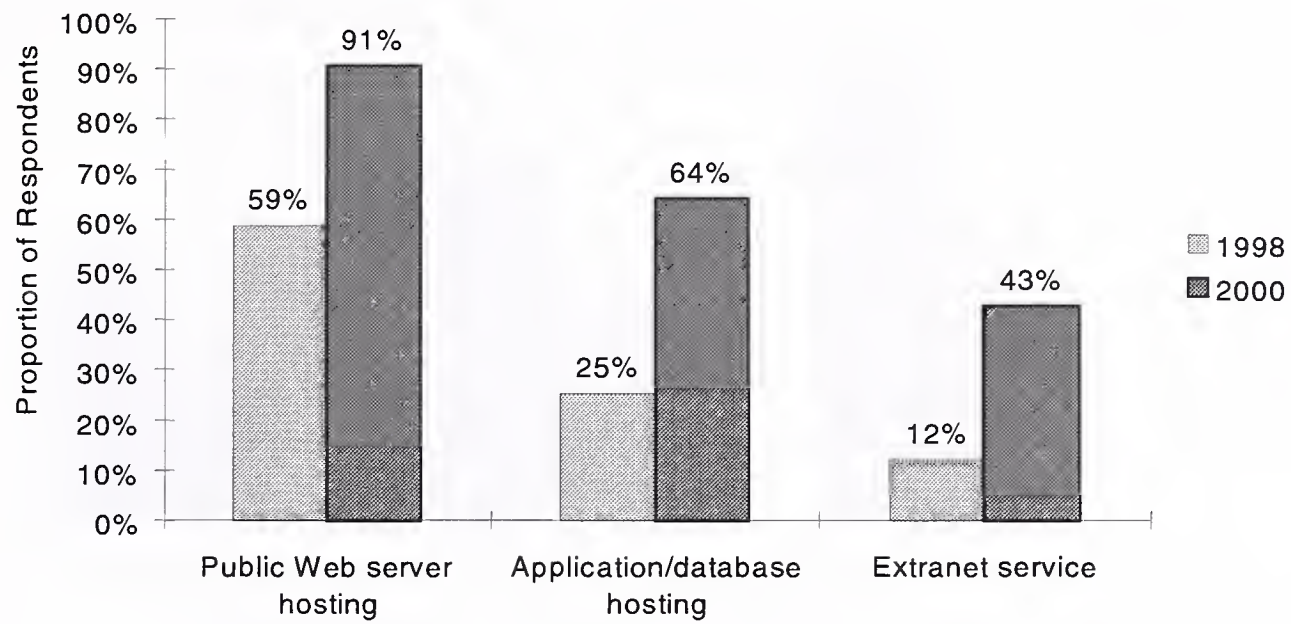
Sample: 75

Source: INPUT

Exhibit III-4

Current and Expected Use of ISP Services, 1998-2000, Finance
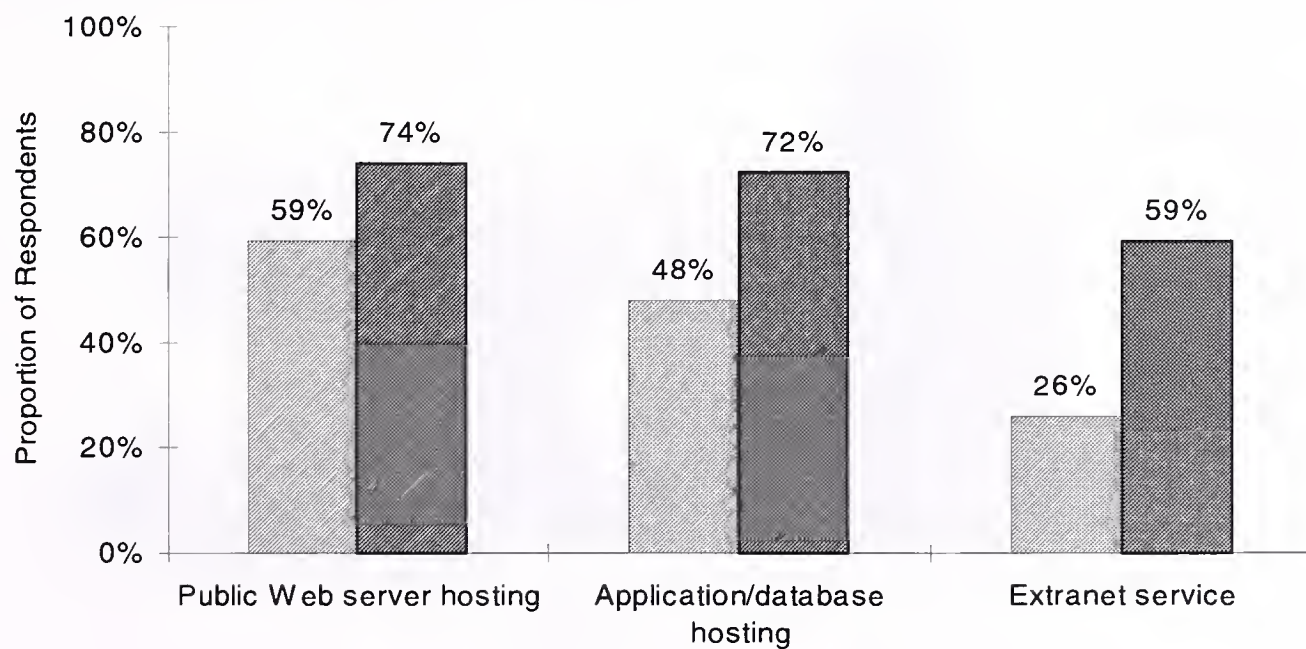
Sample: 54

Source: INPUT

Exhibit III-5

Current and Expected Use of ISP Services, 1998-2000, Manufacturing
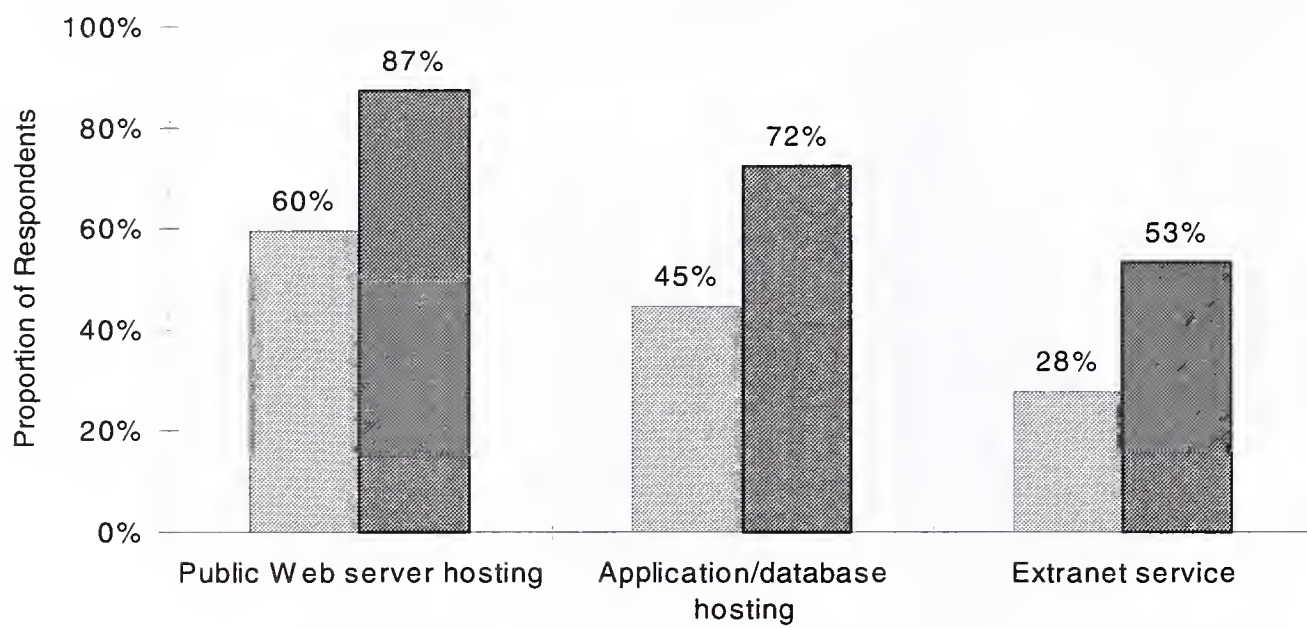
Sample: 47

Source: INPUT

Exhibit III-6

Current and Expected Use of ISP Services, 1998-2000, Retail
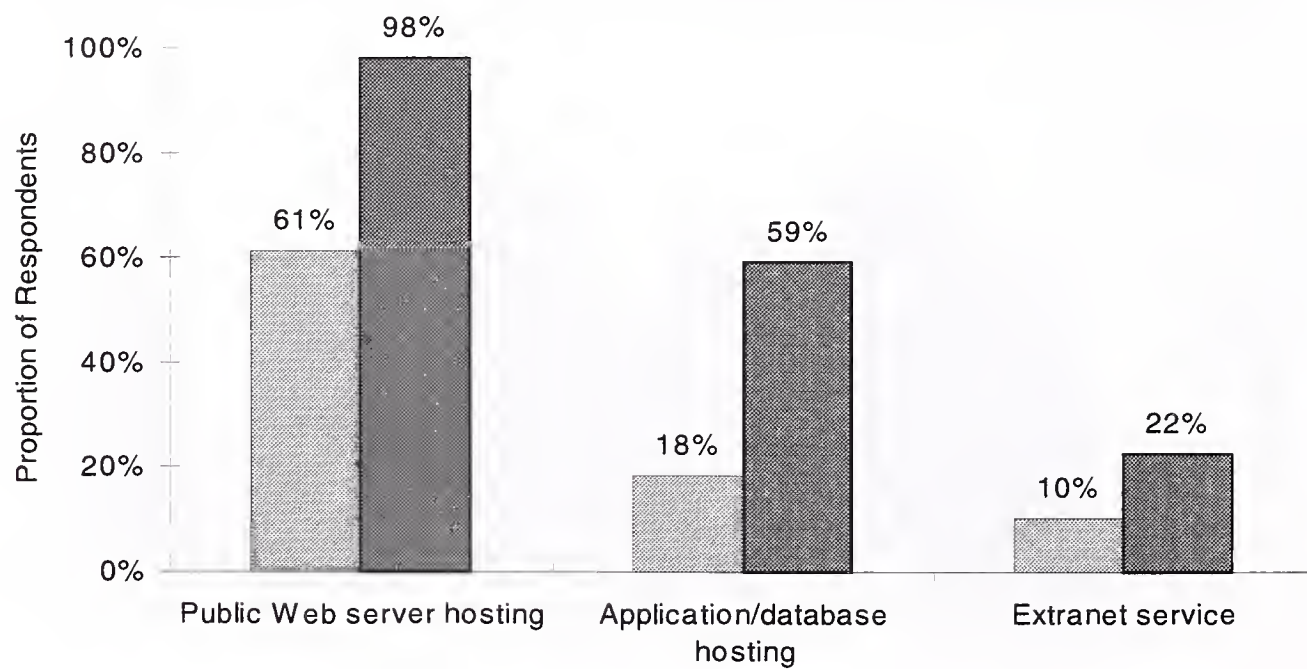
Sample: 49

Source: INPUT

B

Scope of Access Within Organizations

In the US, 90% of large organizations (revenues over $100 million), and 75% in Europe, have Internet access. The market for Internet access does not stop there, however. There is room for growth supplying basic access to employees that currently have no access. Exhibits III-7 to III-9 show the proportions of employees that currently have email and Web access among companies surveyed, by region, country, and industry. The opportunities for ISPs are in providing higher capacity connections, extensive implementation services to serve an increasing user base within individual companies, and increasing revenue through traffic volume-based pricing models.

In a typical US organization interviewed, half the employees have Web access; in Europe, a quarter. In France, the figure drops to just 17%.

Among US respondents, one third gave email access to 100% of staff; in Europe one quarter did. Company-wide Web access was seen in only 10% of US and European companies.

Exhibit III-7

Scope of Email and Web Access Within Organizations, by Region
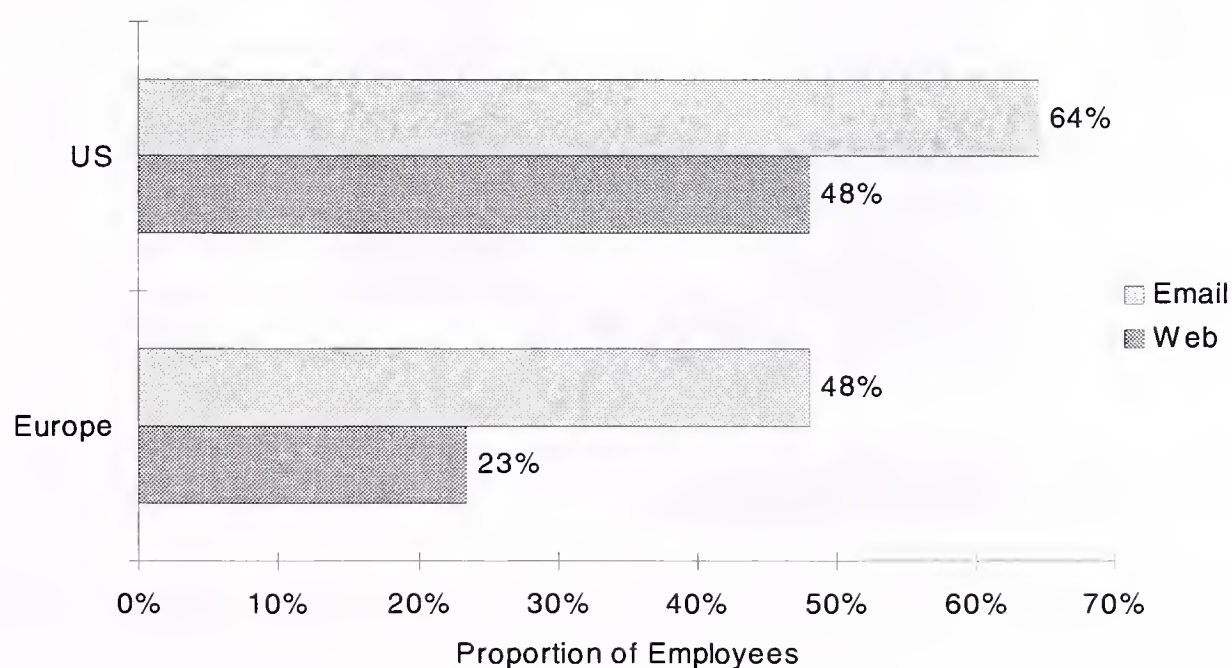
Sample: 145

Source: INPUT

Exhibit III-8

Scope of Email and Web Access Within Organizations, by Country

US — Email 64%, Web 48%
UK — Email 55%, Web 28%
Germany — Email 54%, Web 24%
France — Email 34%, Web 17%

Proportion of Employees
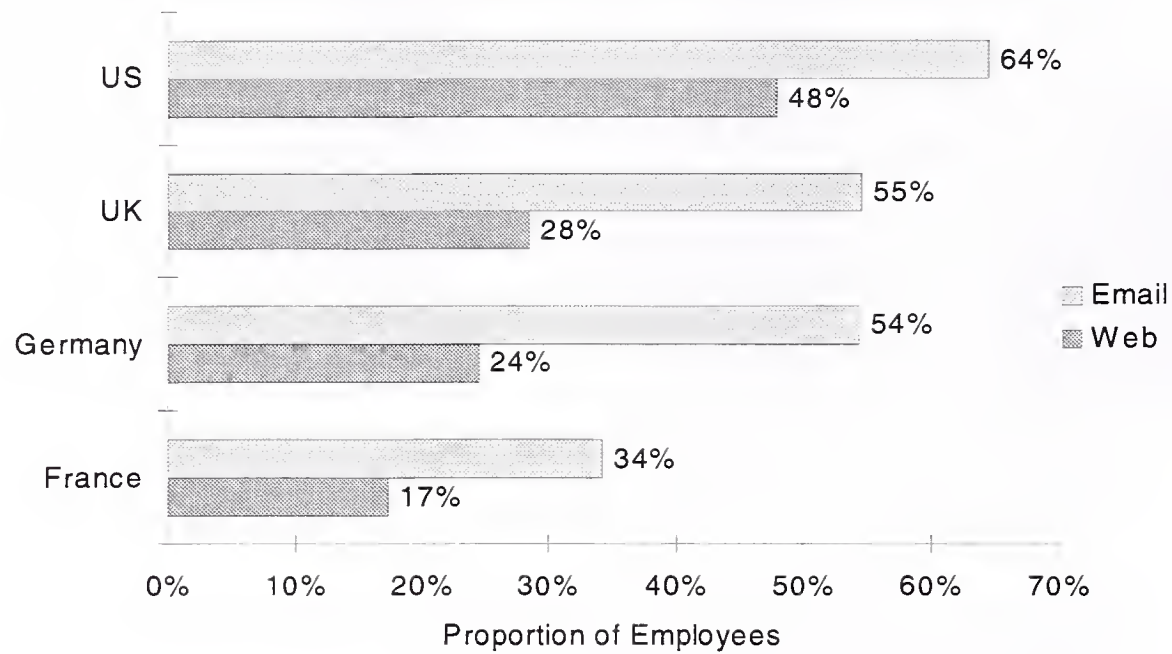
Sample: 145

Source: INPUT

Exhibit III-9

Scope of Email and Web Access Within Organizations, by Industry

Finance — Email 68%, Web 38%
Manufacturing — Email 53%, Web 41%
Retail — Email 47%, Web 28%

Proportion of Employees

Sample: 145

Source: INPUT

EI18W
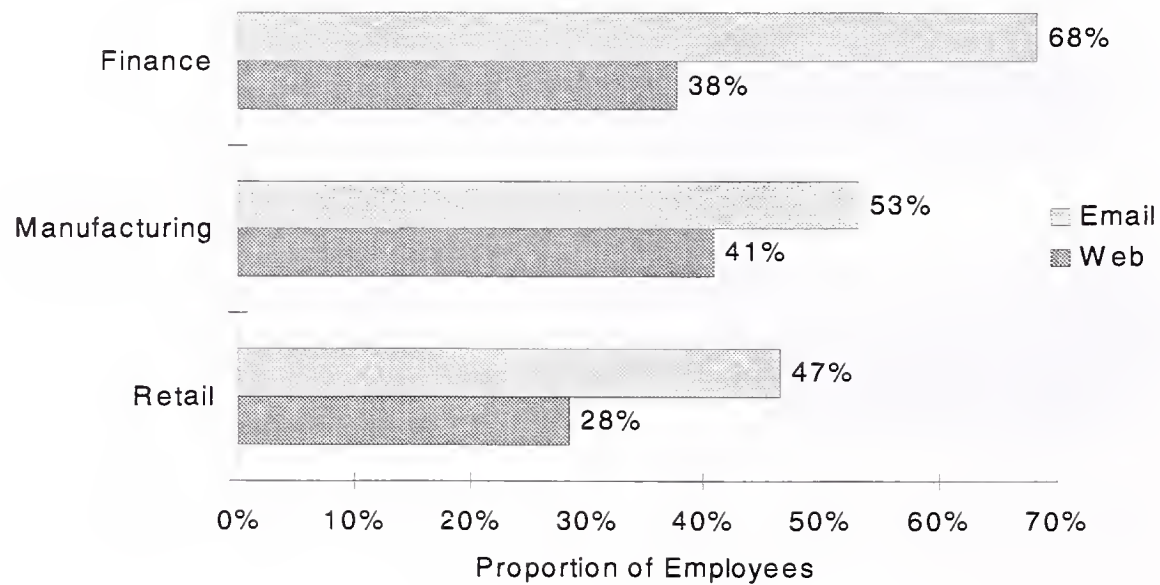
C

Internal and External Traffic

A measure of expected ISP traffic growth can be made by comparing the proportion of corporate network traffic that remains internal to an organization and that which goes beyond the corporate boundary. Network traffic is becoming increasingly external, as a proportion of total traffic, as shown in Exhibit III-10. The ratios shown here will continue to change in favor of external traffic beyond 2000—by 2002, 45% of traffic is expected to be routed outside the corporate network as companies conduct electronic business (personal communication, information sharing, and commerce) with customers and partners.

US and European respondents reported very similar proportions for 1998 and 2000.

Exhibit III-10

Internal and External Traffic Volumes, Worldwide
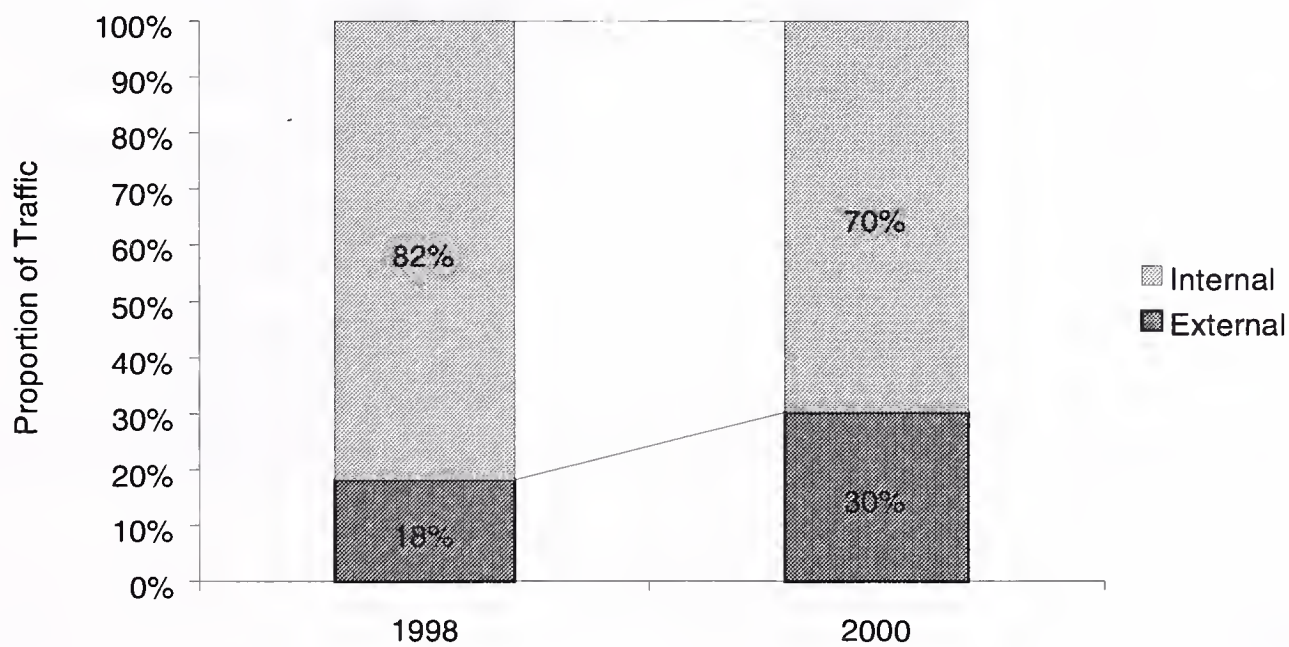
Sample: 130

Source: INPUT

Of a company's external traffic, one third is currently carried via the Internet as shown in Exhibit III-11. Within two years, this proportion will nearly double. The Internet is accounting for a rapidly increasing

proportion of external traffic at the expense of private WANs and proprietary VAN services.

US organizations make more use of the Internet for external traffic than European companies. Among US respondents, 40% of external traffic goes over the Internet, rising to 62% by 2000. In Europe, the figures were 27% rising to 53%.

Exhibit III-11

External Traffic Carried Over Internet, Worldwide
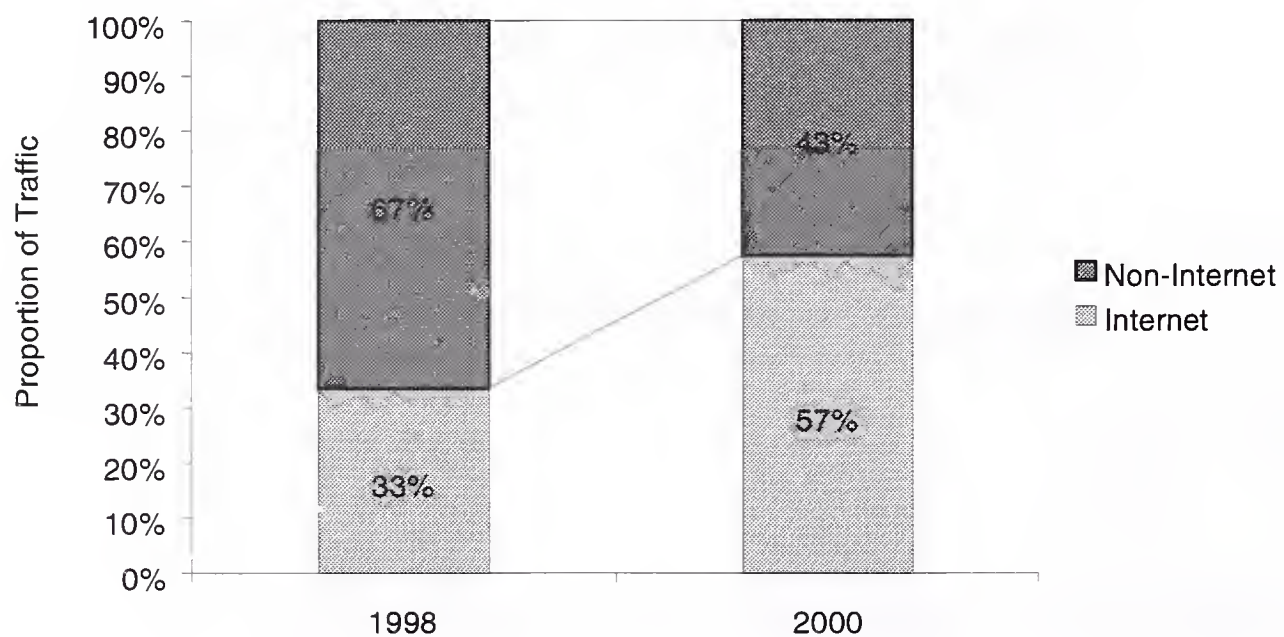
Sample: 113

Source: INPUT

D

ISPs Used

Major telcos are the most commonly used type of ISP for Internet access. Exhibits III-12 to III-15 show ISPs used by respondents in each country covered. Unlike the US, France and Germany, there was a low telco presence in the UK, where dedicated ISP organizations account for most usage.

Across the US and Europe, UUNET, Compuserve and telcos such as MCI, AT&T, France Telecom and Deutsche Telekom have high credibility as

corporate Internet access providers. Most of the ISPs represented in these Exhibits (used by two or more respondents) are telcos, large providers, or members of consortia, and therefore are well placed for competing in the future consolidated market.

Within the sample, Compuserve is used for business access more in Europe than in the US. This is due partly to Compuserve's strong European presence and that fact that it is more advanced than many US competitors in establishing a European presence. Additionally, Compuserve has a long history of supplying the SME business sector, more than the large corporate market. European organizations are typically at an earlier stage in their Internet development than equivalent US companies, and may be more likely to subscribe to easy-to-use online services such as Compuserve at this earlier stage of development.

Exhibit III-12

ISPs Used, US
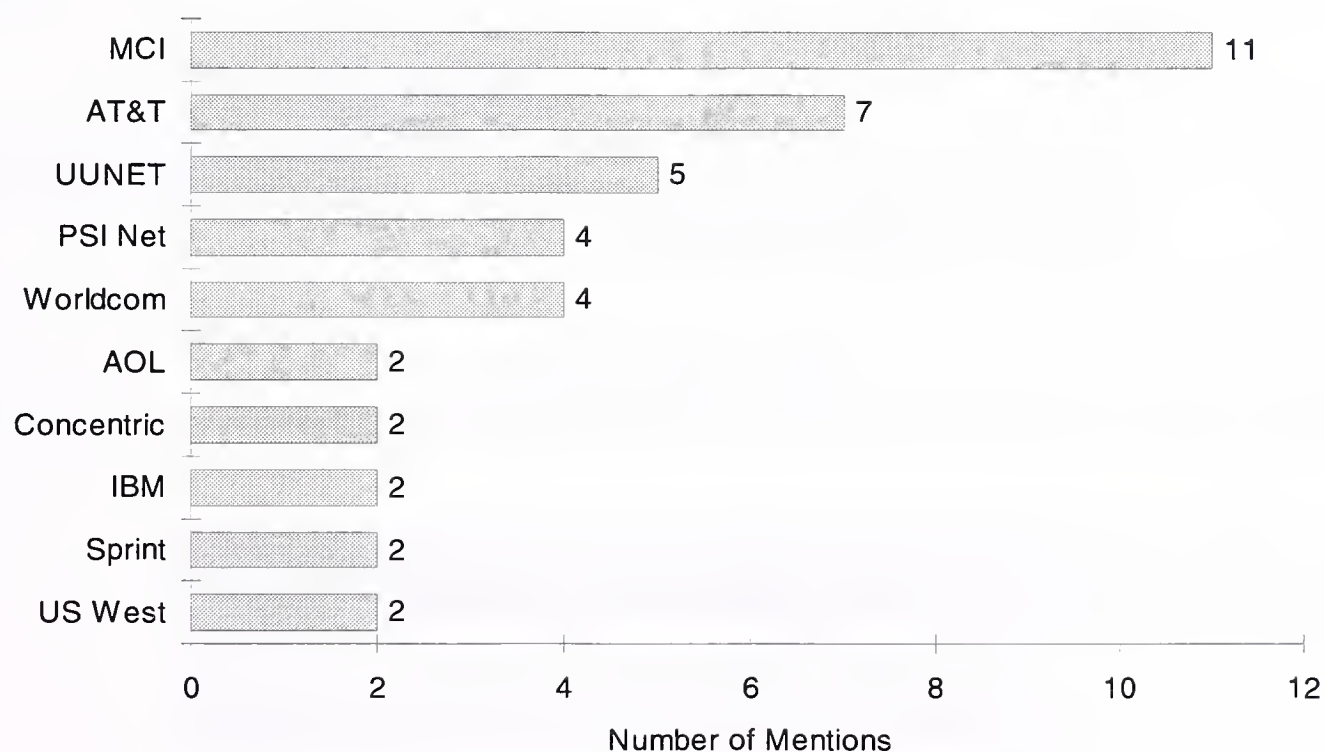
Sample: 55

Source: INPUT

ISPs mentioned by one US respondent each were: BBN, Bell Pacific, Brooks Fiber, BSP, Cloud Nine, Colorado Supernet, Compuserve, Concert, Cyburban Link, Extex, GEIS, Global VIP, GTE, IBS, Infinet, MFS, Millenium, MR Net, MVP-Net, Net Asset, Net Direct, Netcom, Nynex, On-Ramp, Raex (formerly Imperium), and TCGCS.

Exhibit III-13

ISPs Used, UK

Compuserve 5
IBM 4
UUNET/Pipex 3
Demon 2
Infonet 2

Number of Mentions
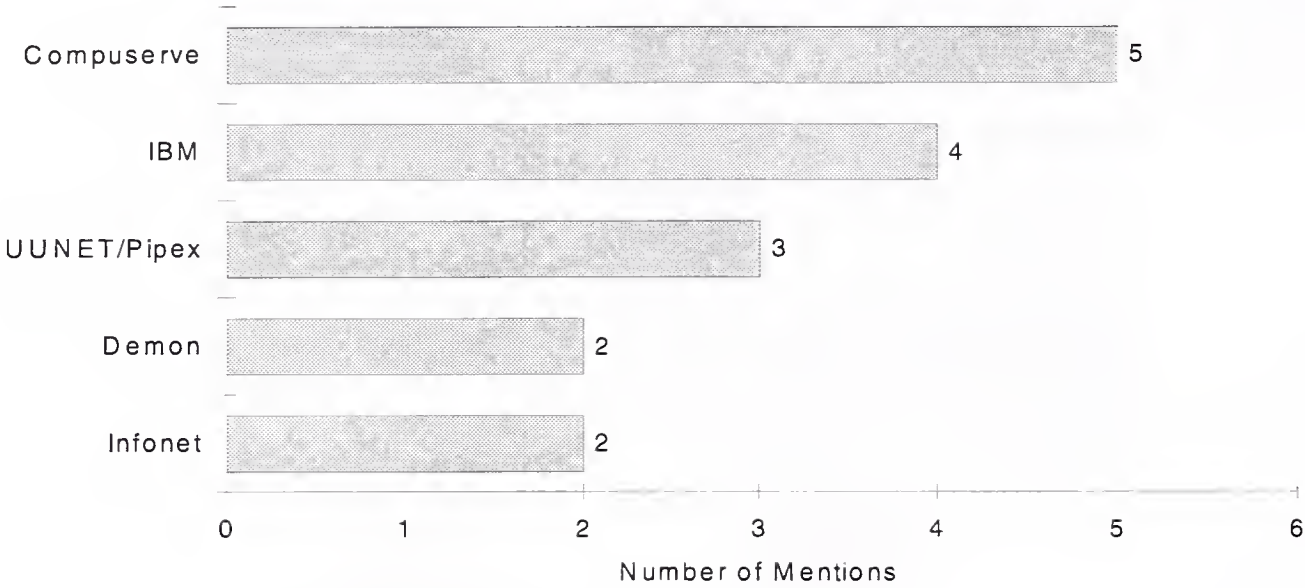
Sample: 21

Source: INPUT

ISPs mentioned by one UK respondent each were: Anglia Net, AOL, BT, ClaraNET, Internet Discovery, IT Net, Limnet, Scotland Online, Star, Supernet, and Virtual Business (formerly Netscope).

Exhibit III-14

ISPs Used, France

Compuserve 5
France Telecom 5
Club-Internet 2
Infonet 2

Number of Mentions
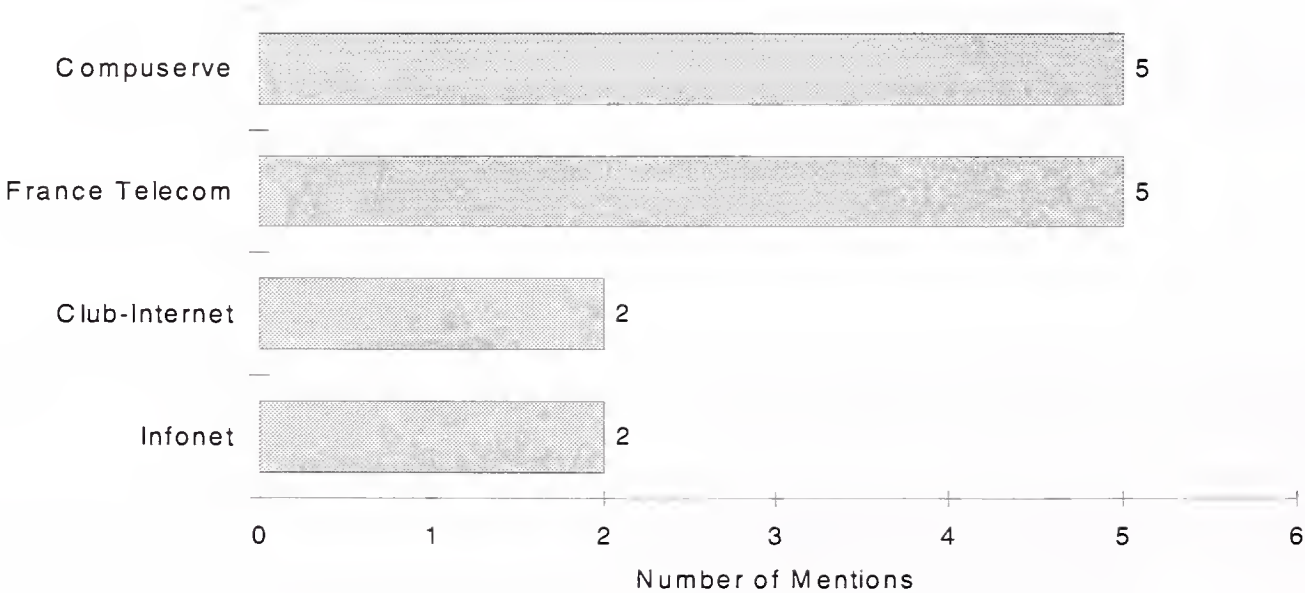
Sample: 19

Source: INPUT

ISPs mentioned by one French respondent each were: Axone, Belgecom, BT, EUnet, HOL, Magic Online, UUNET, and X-link.

Exhibit III-15

ISPs Used, Germany
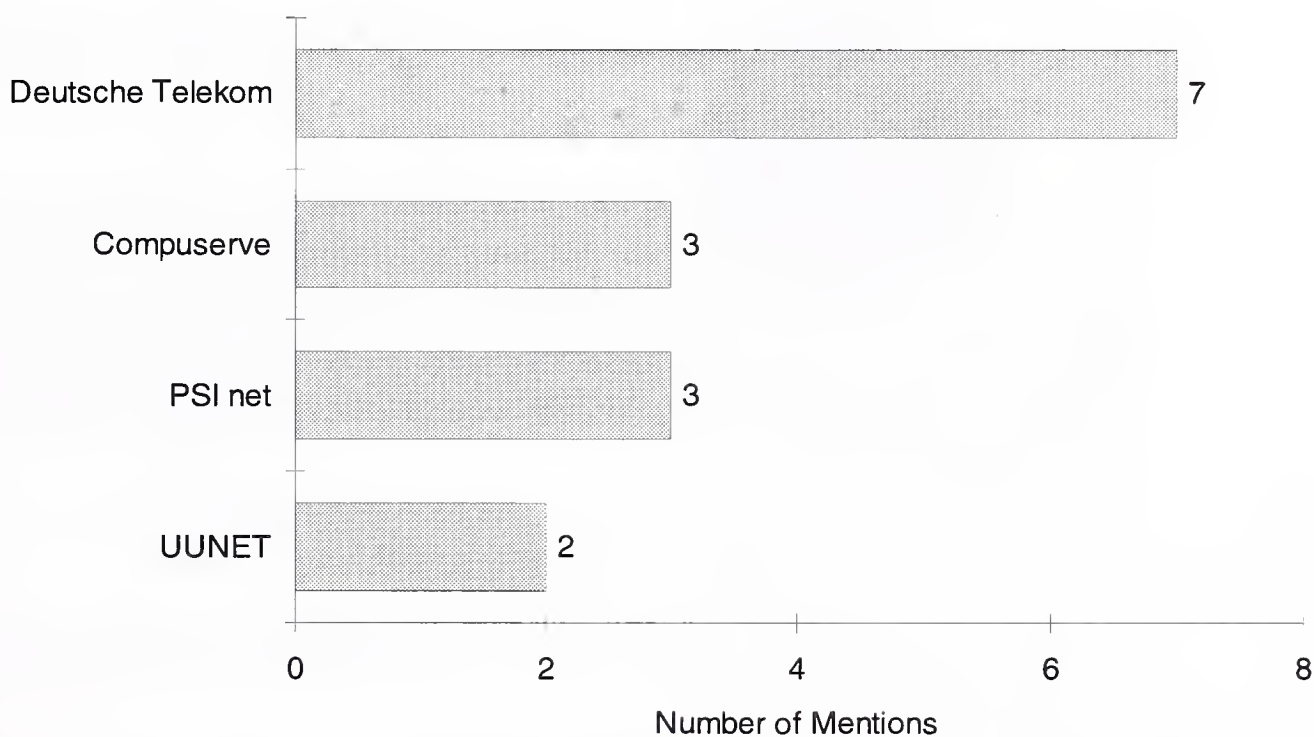
Sample: 19

Source: INPUT

ISPs mentioned by one German respondent each were: AT&T, ECRC, EUnet, Germany.net, IBM, Nacamar, Netcom, Sprint, and Worldcom.

E

Expected Change in ISP Use

Around one in five respondents expected to change their ISP over the period 1998-1999 (Exhibits III-16 to III-18). The figure is slightly higher in Europe than in the US.

The reasons given by respondents for seeking an alternative ISP were as follows:

- Need to consolidate multiple ISP connections into one corporate connection (four respondents)

- Performance issues with current ISP (four respondents)

- Poor quality service (three respondents)

- Current ISP does not provide dedicated server hosting (two respondents)

- ISP is good at Internet access but all other services are lacking (one respondent)

The most commonly named ISP that users expect to drop in favor of an alternative was Compuserve. Although Compuserve was the most popular single-brand provider overall, used by 14 respondents who named their ISP, that alone is not sufficient to explain the expected high turnover. For example, MCI was used by 11 US respondents, yet none of them expected to change provider.

The expected high loss of Compuserve customers is due to:

- The long period of uncertainty over Compuserve's future before its acquisition by AOL

- The more prevalent use of Compuserve as a business-class ISP by European organizations than by US organizations. Companies in Europe are less well connected than in the US, and they may be using Compuserve still as a testbed ISP before moving to a corporate-wide, higher-value service.

Exhibit III-16

Change of ISP Expected Within 12 Months, Worldwide

Yes
18%

No
82%
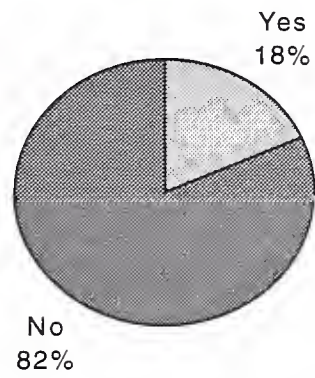
Sample: 142

Source: INPUT

Exhibit III-17

Change of ISP Expected Within 12 Months, US

Yes
14%

No
86%
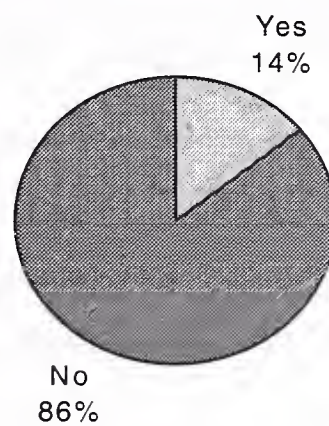
Sample: 71

Source: INPUT

Change of ISP Expected Within 12 Months, Europe

Yes
23%

No
77%

Sample: 71

Source: INPUT
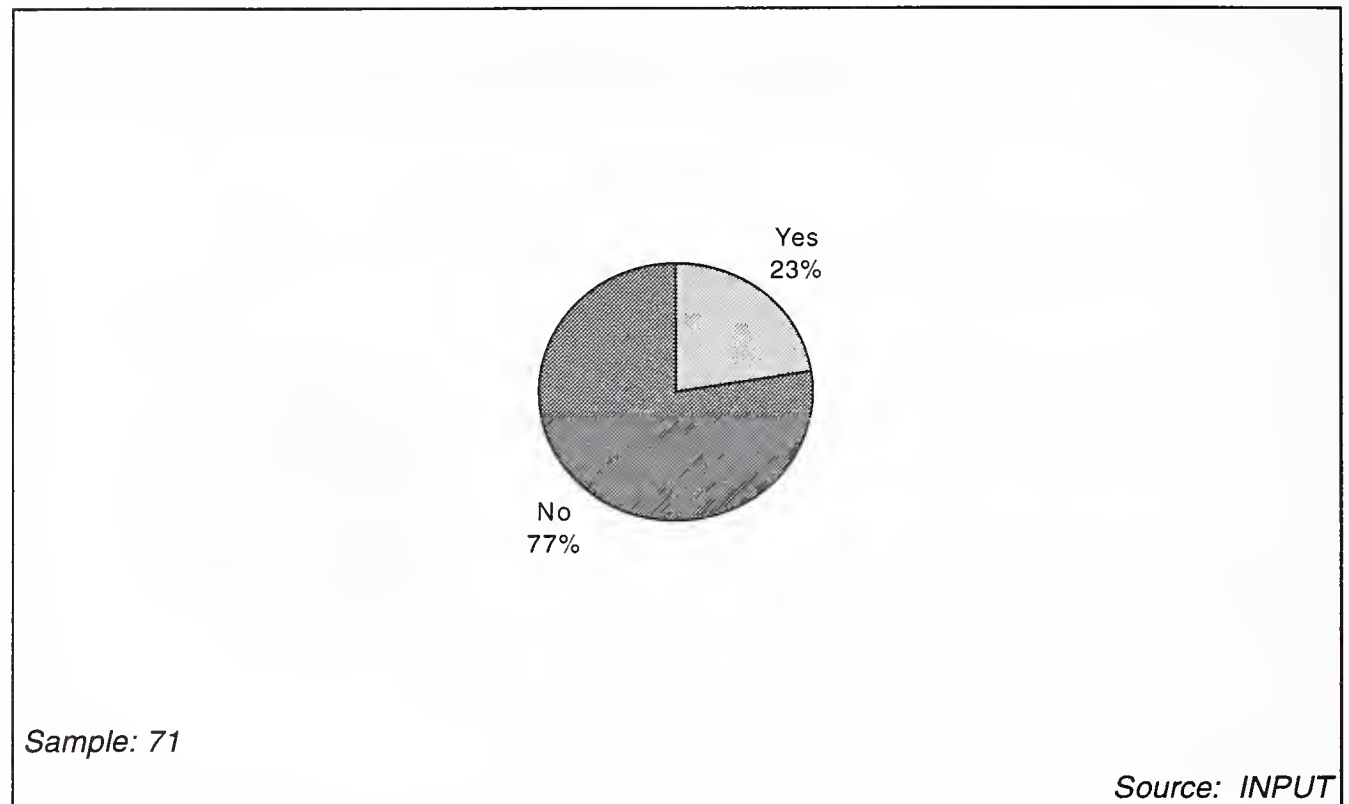
F

Bandwidth Usage

Exhibit III-19 shows the use of bandwidth stated by US respondents, starting at 64Kb/s. A small proportion of respondents provided Internet access to employees via dialup connections (modem and ISDN), not dedicated lines, and are not shown in the Exhibit. Too few European organizations gave details of their bandwidth to represent.

Exhibit III-19

Bandwidth Usage, US

Bandwidth	Number of Mentions
64 Kb/s	6
128 Kb/s	2
256 Kb/s	1
1.5 Mb/s	1
T1 (1.544 Mb/s)	29
2 x T1	2
4.5 Mb/s	1
6 Mb/s	1
10 Mb/s	2
34 Mb/s	2
T3 (45 Mb/s)	3
100 Mb/s	1
Multiple T3s	1

Number of Mentions
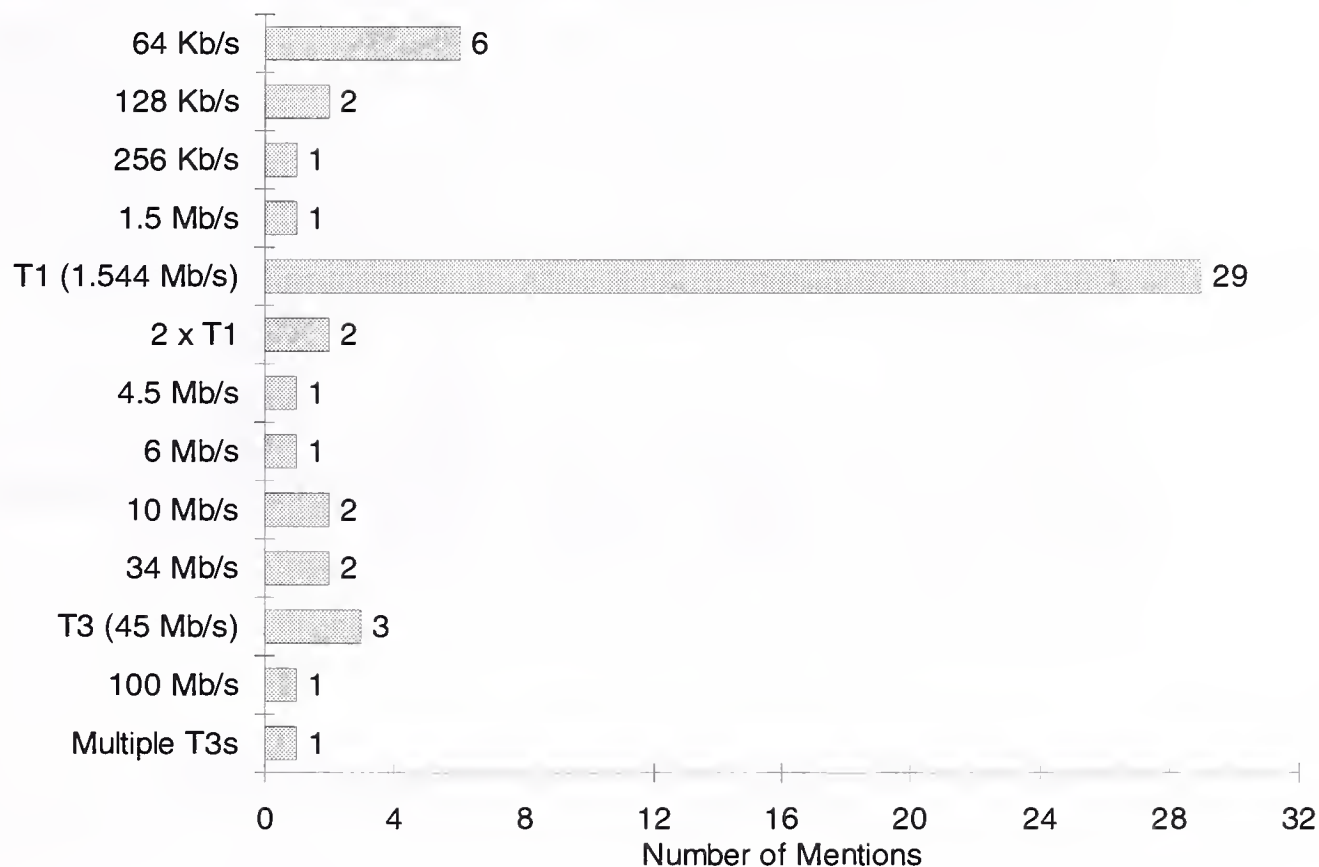
Sample: 52

Source: INPUT

Clearly the most common method of connecting to an ISP is via a single T1 line, providing 1.544Mb/s. Bandwidth is purchased in various ways: for example, connections between 64Kb/s and 256Kb/s include fractional T1s and multiple separate 64Kb/s lines.

There is a high variance of bandwidth usage among the sample, with manufacturing companies the most common at the high end. The US company that claimed use of multiple T3 (45Mb/s) connections was an aerospace manufacturer; the 100Mb/s user was a manufacturing company; the three single-T3 customers were (one) manufacturing and (two) retail organizations.

Fewer European organizations gave details of their bandwidth. Of those that did, most were between 64Kb/s and 256Kb/s. The highest was a German manufacturing organization with a 34Mb/s connection to PSI Net.

G

Service Guarantees

Service guarantees are set to become a critical requirement of ISPs. Exhibits III-20 to III-22 show the uptime guarantees that buyers currently receive and the guarantees that they expect to receive by 2000. The change required organizations is clear: half currently receive no guarantee, yet the same proportion expect to achieve very high levels within two years. This change is most evident across Europe, where service guarantees of any sort are received by only a third of organizations.

Exhibit III-23 shows uptime currently attained. Around 40% achieve less than 99% uptime, which is unacceptable in an electronic business environment.

Exhibit III-20

Current and Expected Service Levels, Worldwide
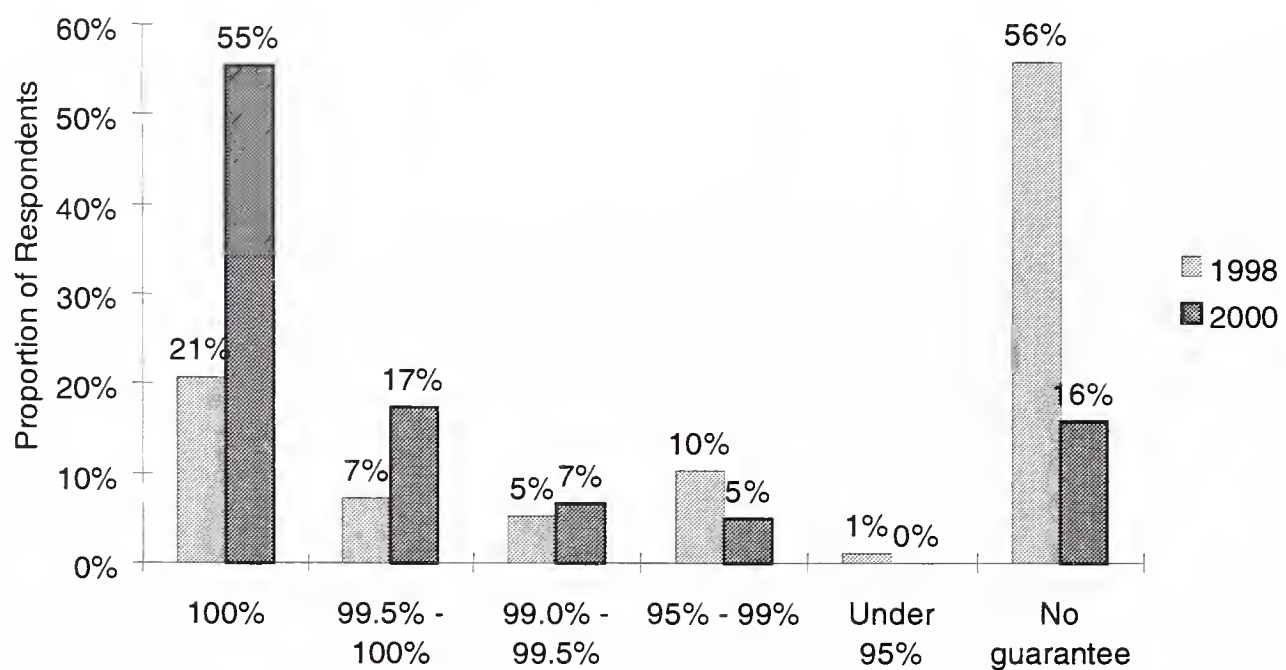
Sample: 121

Source: INPUT

Exhibit III-21

Current and Expected Service Levels, US

1998
2000

Proportion of Responden

Category	1998	2000
100%	33%	60%
99.5% - 100%	10%	26%
99.0% - 99.5%	6%	5%
95% - 99%	10%	5%
Under 95%	0%	0%
No guarantee	40%	5%
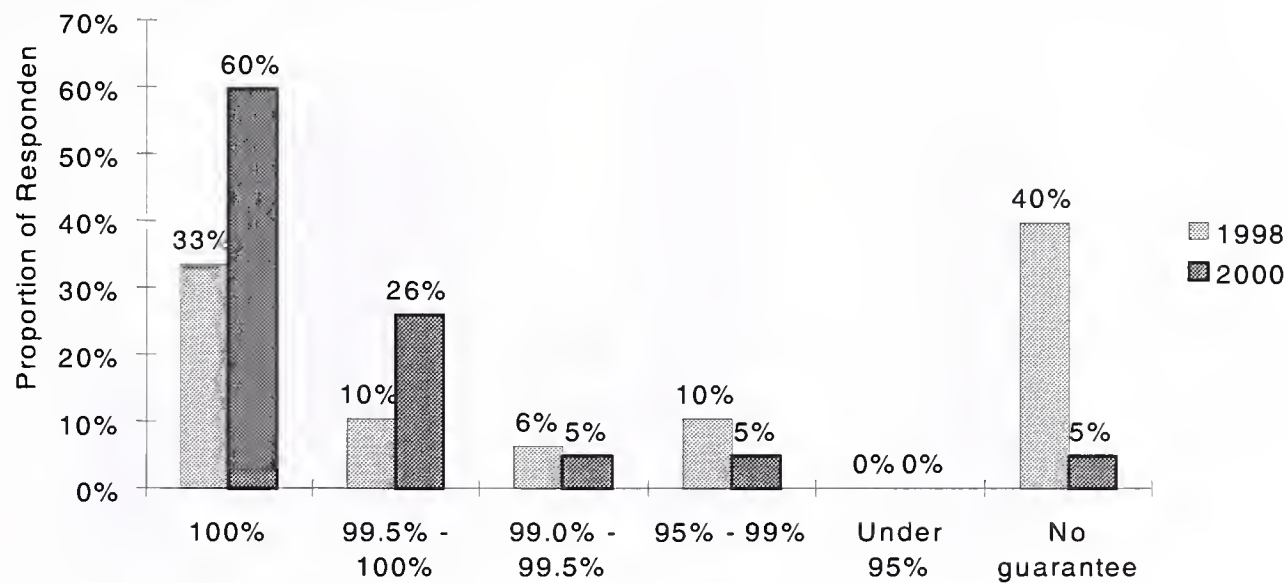
Sample: 62

Source: INPUT

Exhibit III-22

Current and Expected Service Levels, Europe

1998
2000

Proportion of Respondents

Category	1998	2000
100%	8%	51%
99.5% - 100%	4%	8%
99.0% - 99.5%	4%	8%
95% - 99%	10%	5%
Under 95%	2%	0%
No guarantee	71%	27%
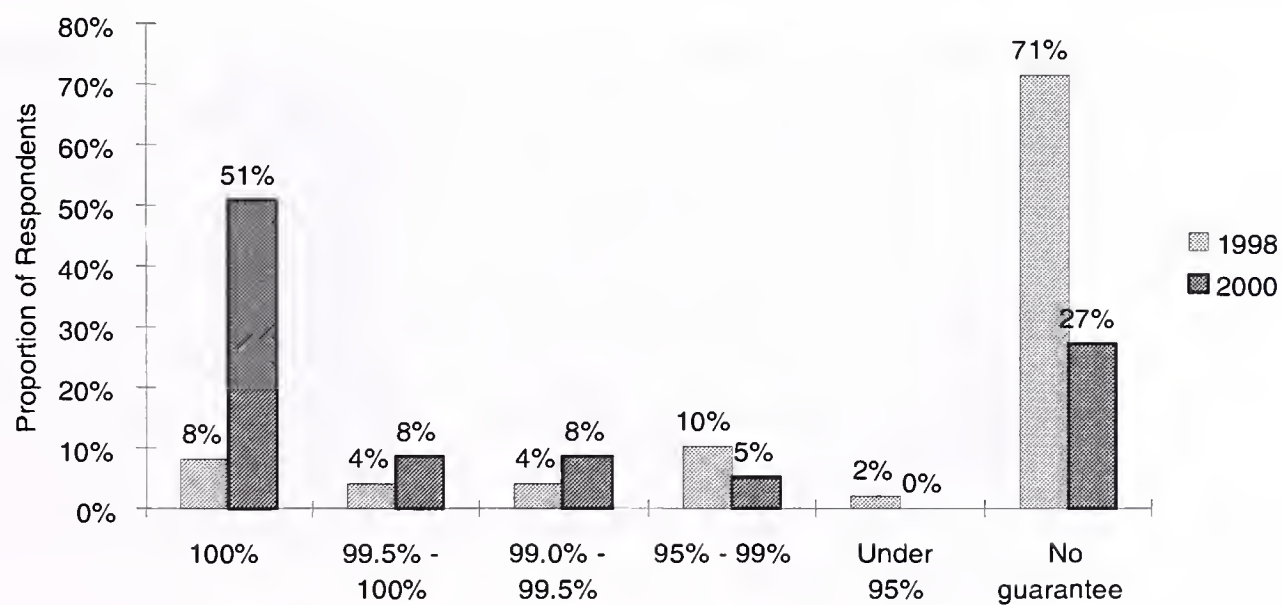
Sample: 59

Source: INPUT

Exhibit III-23

Service Levels Typically Achieved, Worldwide
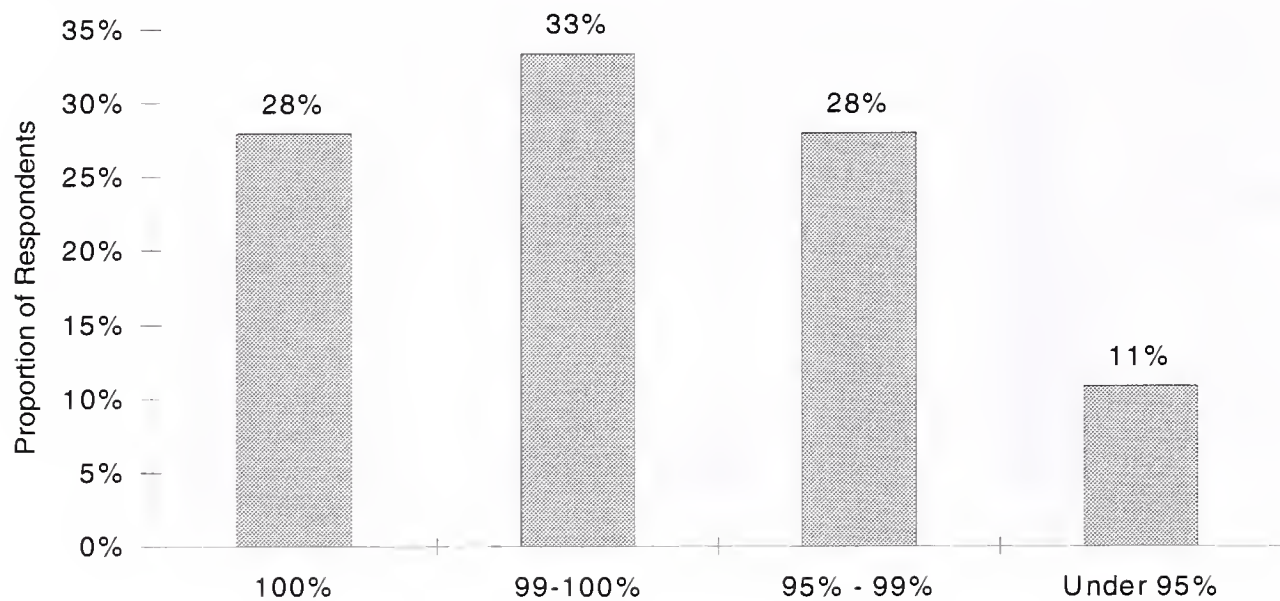
Sample: 111

H

Payment Schemes

For permanent corporate Internet connections, the most common ISP billing mechanisms are fixed fee (monthly, quarterly, and annual) and traffic-volume-based pricing. Fixed monthly or quarterly billing is the default method for most ISPs and, overall, users are satisfied with such schemes. There is growing demand for volume-based pricing, however, notably in the US. European organizations are more likely to be billed by their telco for connection time where dialup and ISDN connections are used and do not see the same benefit in additional per-usage charging. In the US and Europe, many users with longer-term annual charges want to move to a more flexible scheme, giving them the option to change provider at reasonable notice.

Currently, compared with the European average, monthly/quarterly billing is particularly popular in Germany and annual billing is more common in France. The overall European preference for volume-based pricing is dampened by the results seen in the UK, where no organization

stated a preference for this scheme. Around 20% of French and German organizations preferred such a mechanism.

Exhibit III-24

Current and Preferred Payment Schemes, Worldwide
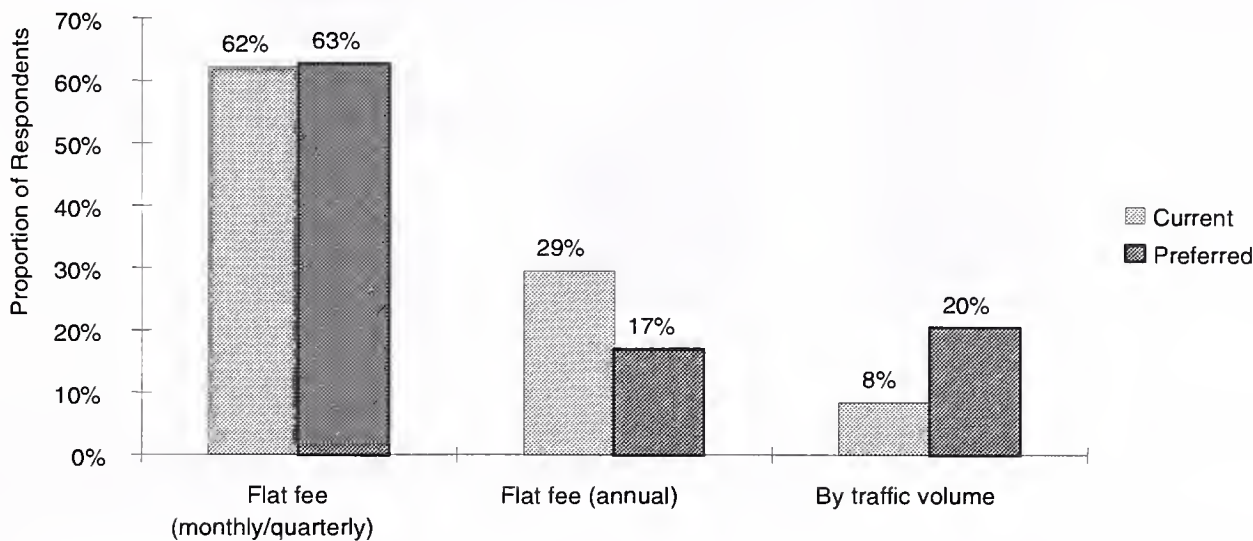
Sample: 119

Source: INPUT

Exhibit III-25

Current and Preferred Payment Schemes, US
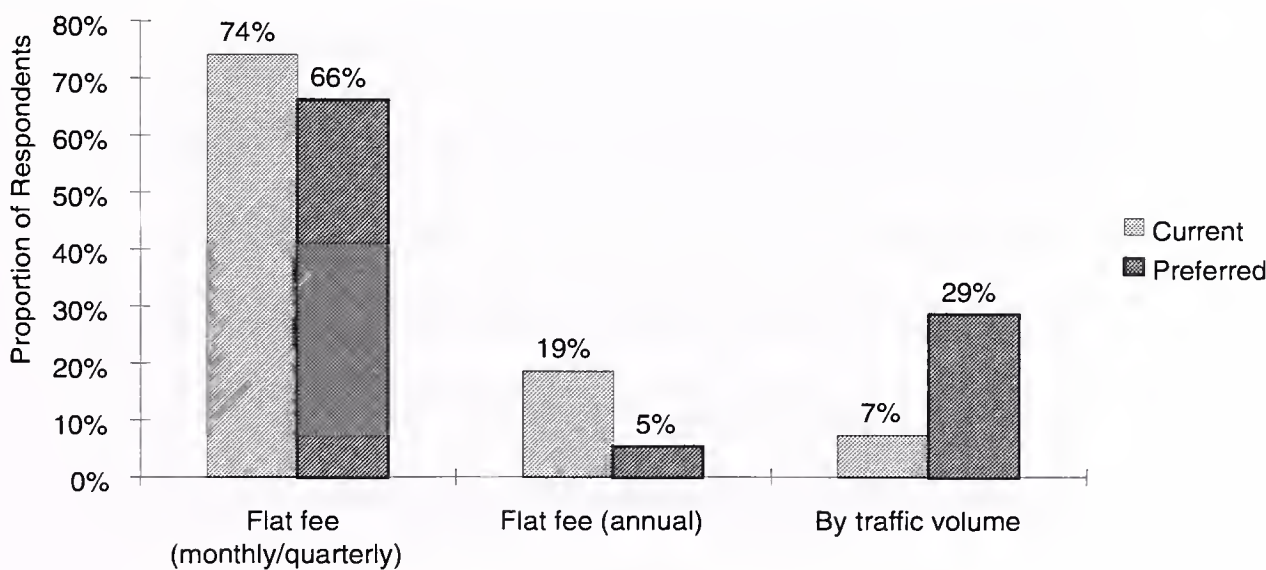
Sample: 54

Source: INPUT

Exhibit III-26

Current and Preferred Payment Schemes, Europe

Sample: 65

IV
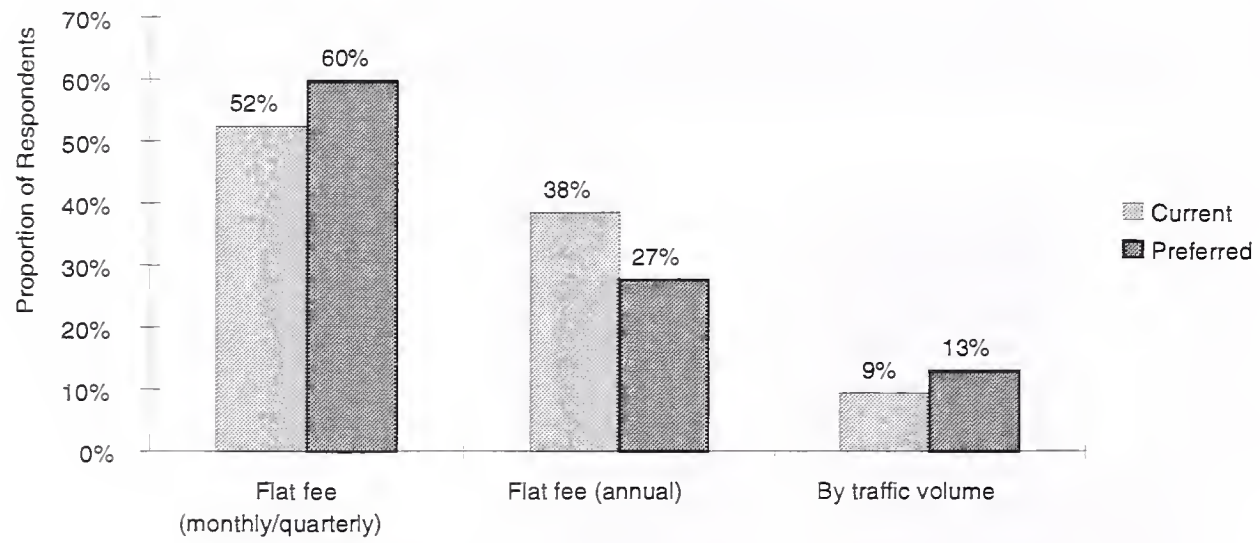
Internet Access Satisfaction and Criteria

A
Overall Satisfaction With Internet Access

Exhibits IV-1 to IV-6 show the overall satisfaction ratings given by respondents to their Internet access service. Levels are consistently high, the only sample segments giving an overall rating of less than 4 out of 5 being French respondents and European respondents in the retail industry.

Exhibit IV-1

Overall Satisfaction With Internet Access, by Country

Country	Rating
US	4.2
World	4.1
UK	4.1
Germany	4.0
Europe	4.0
France	3.9

1 — Low
2
3 — Satisfaction
4
5 — High

Average: 4.1
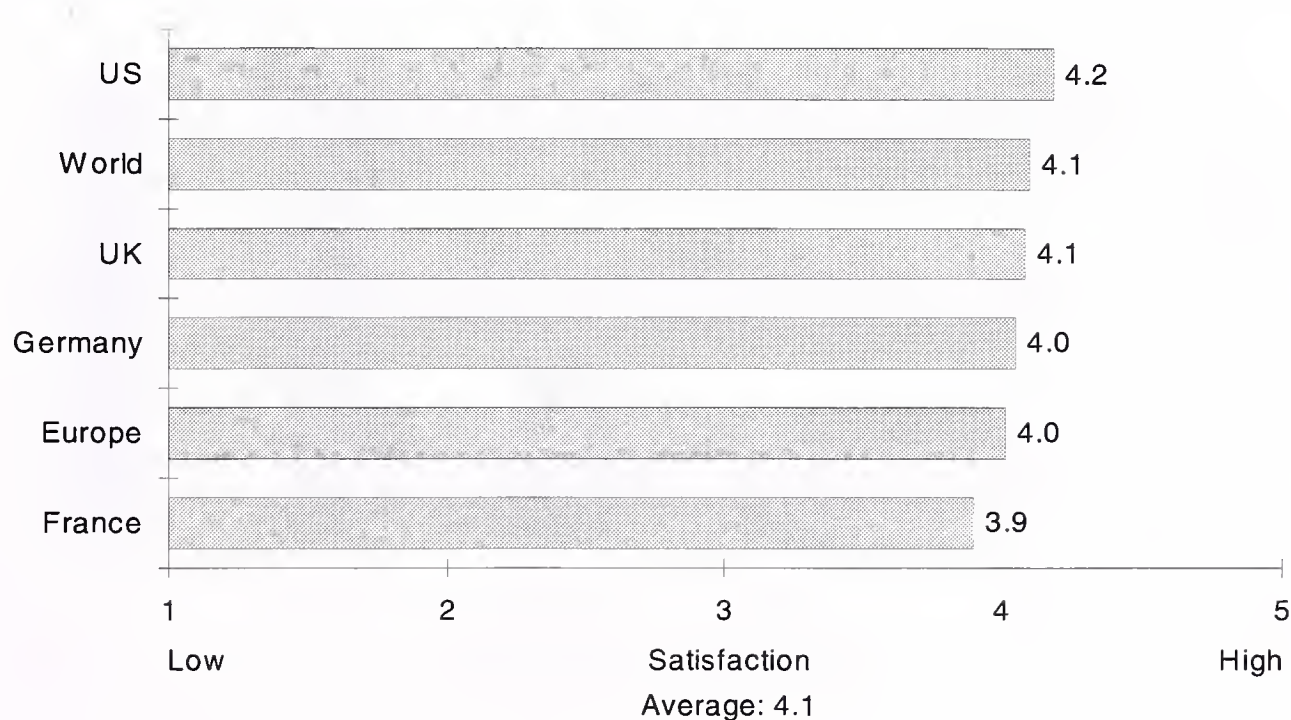
Sample: 131

Source: INPUT

Exhibit IV-2

Overall Satisfaction With Internet Access, by Industry
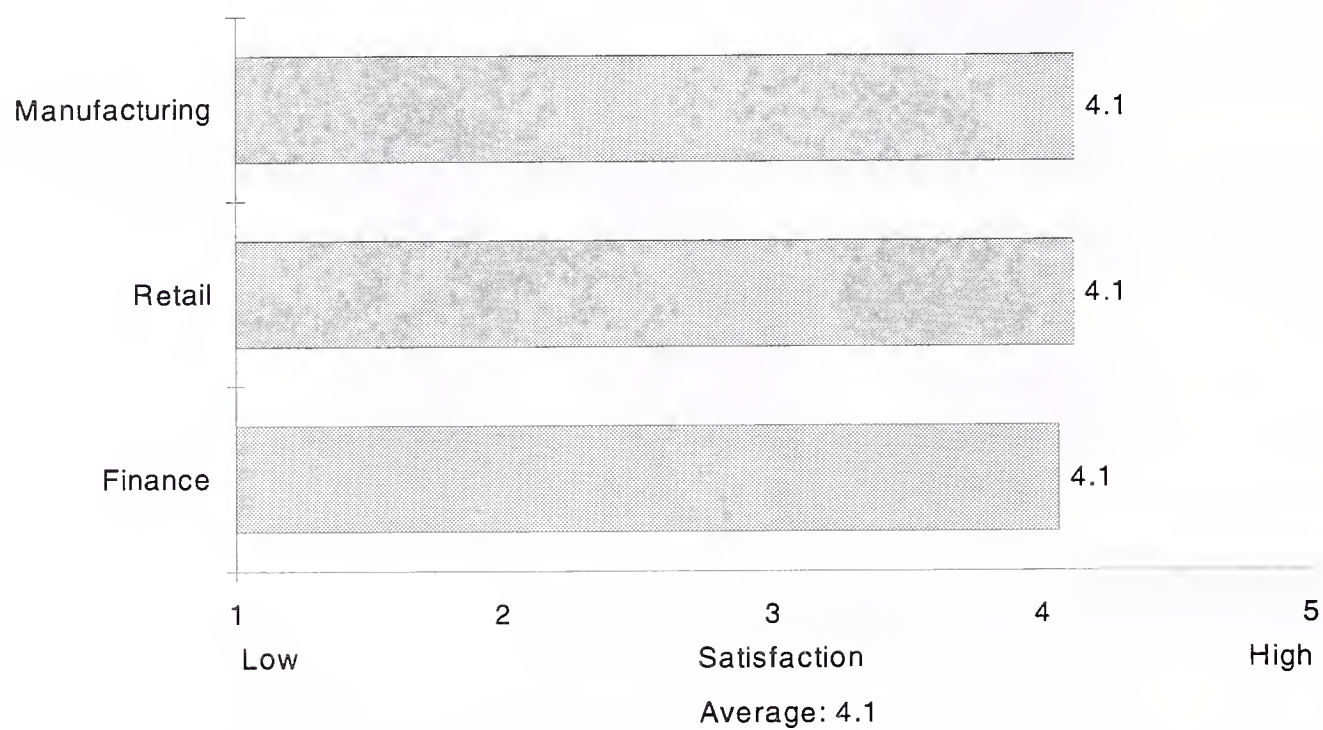
Sample: 131

Source: INPUT

Exhibit IV-3

Overall Satisfaction With Internet Access, US

Sample: 66

Source: INPUT

EI18W
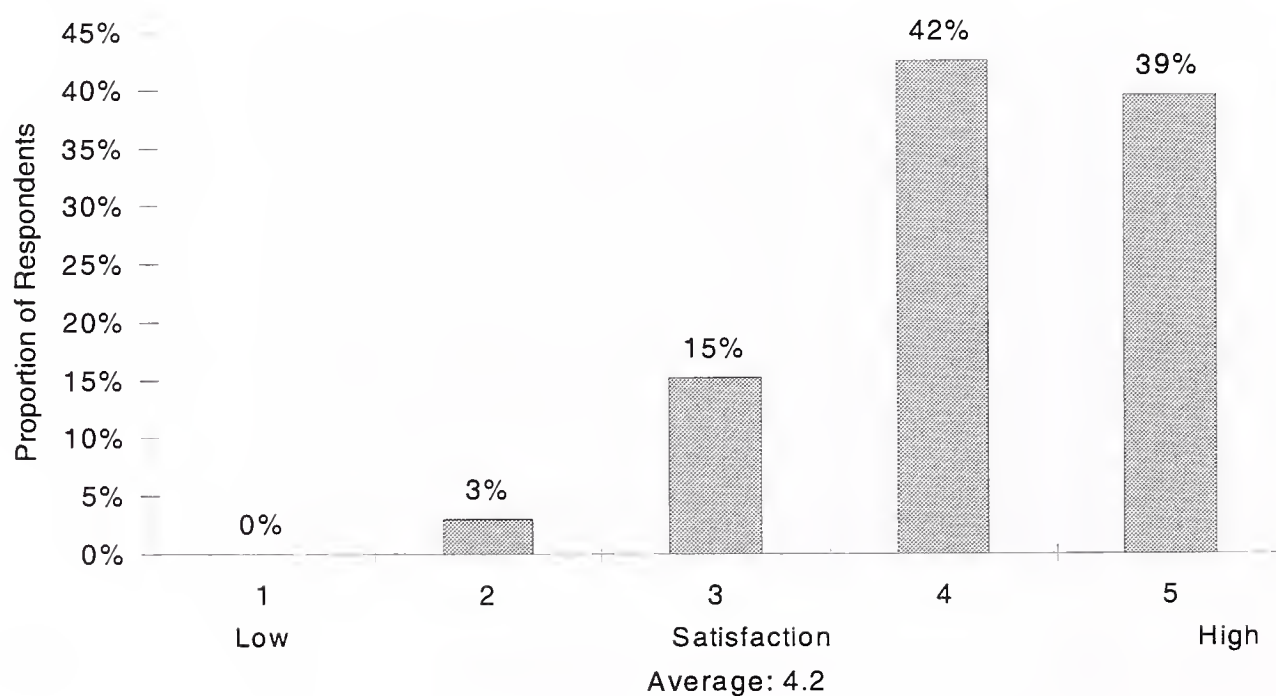
Exhibit IV-4

Overall Satisfaction With Internet Access, Europe
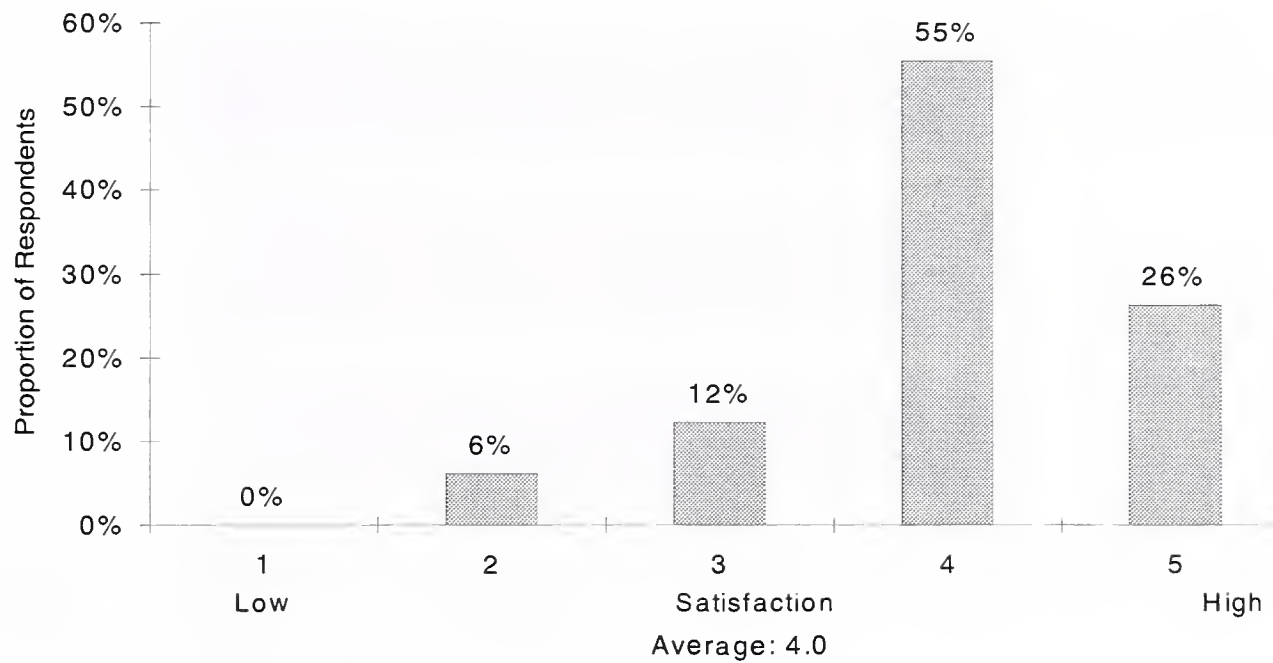
Sample: 65

Source: INPUT

Exhibit IV-5

Overall Satisfaction With Internet Access by Industry, US
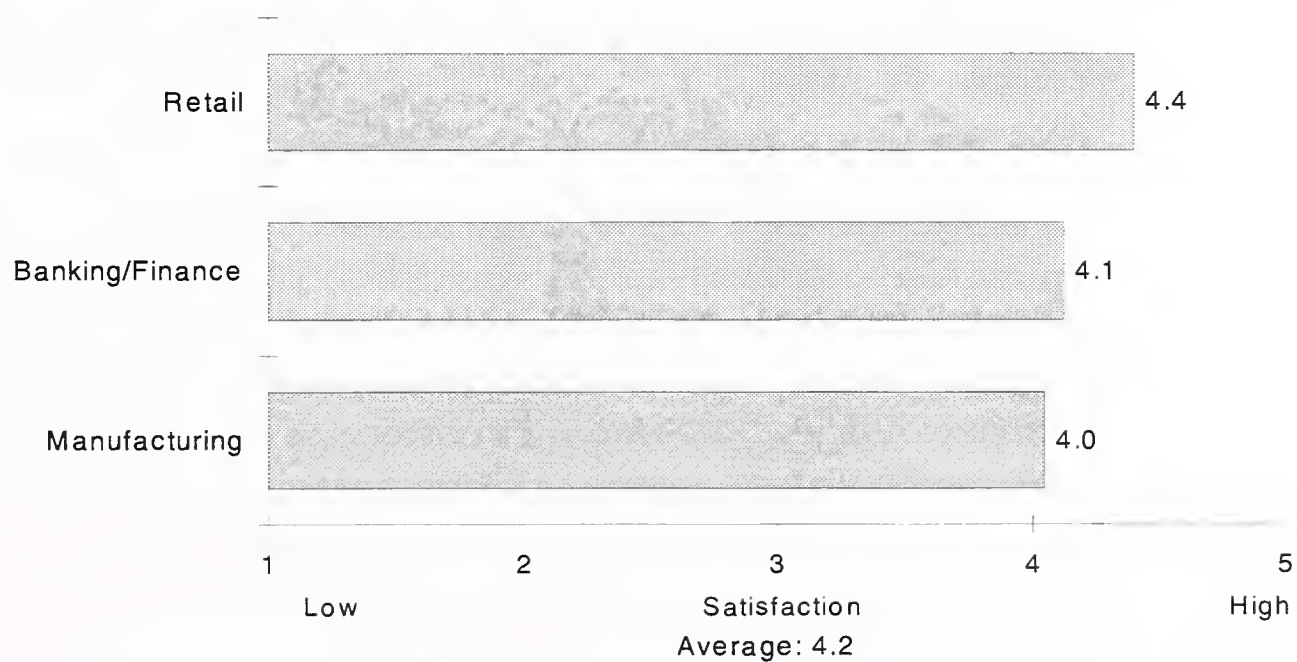
Sample: 66

Source: INPUT

Exhibit IV-6

Overall Satisfaction With Internet Access by Industry, Europe

Manufacturing   4.2

Banking/Finance   4.0

Retail   3.9

| 1 | 2 | 3 | 4 | 5 |
| Low | | Satisfaction | | High |

Average: 4.0
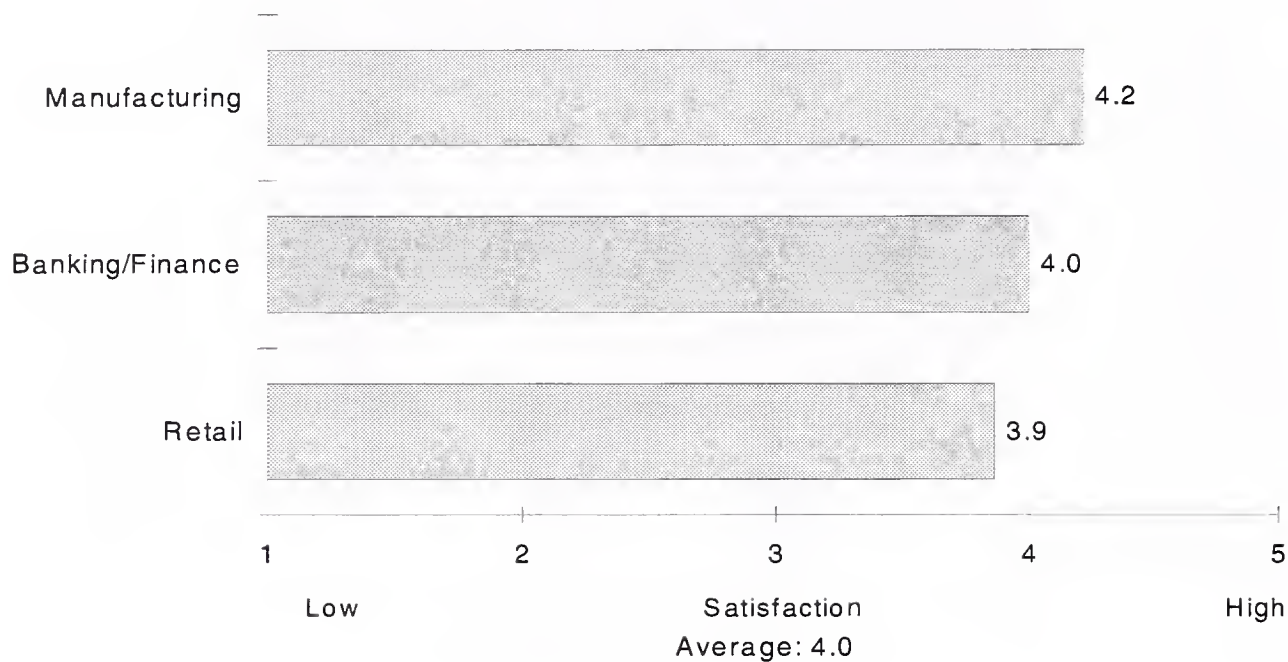
Sample: 65

B

Importance Of And Satisfaction With Internet Access Characteristics

Internet access was broken down into 12 components; Exhibits IV-7 to IV-9 show how important respondents currently consider each characteristic.

The aspect of an access service that most enshrines robust, stable connectivity—reliability/uptime—is considered extremely important by all respondents. Related issues—service continuity, backbone architecture, and commitment to improve and upgrade service—are rated the third, fourth and fifth most important characteristics respectively by both US and European organizations. As Internet connectivity (and related services such as Web and application server hosting) move into the domain of mission-critical services, it will become essential for ISPs to compete on reliability and availability issues.

The most important issue overall is not related to service reliability, however. Respondents placed the highest importance on national coverage. Geographically wide accessibility from a single provider is clearly critical for organizations with disperse offices and branches

operating a corporate access policy. Considered alongside the low importance given to international coverage (dampened by lack of concern among US respondents for overseas connectivity), these are encouraging results for mid-tier ISPs focused primarily at the national level.

The danger for such ISPs is the expected increase in importance of international coverage. This aspect is in the lowest-rated group of characteristics currently, but by 2000 will be, if not of utmost importance, grouped in the band of medium-importance issues.

Overall, US buyers place greater levels of importance on Internet access characteristics than do European buyers. This reflects partly the tendency of US respondents to rate issues slightly higher than European respondents but also the greater degree to which US organizations have already embedded the Internet into their business. The order in which characteristics are ranked in terms of importance, however, are, with the exception of international coverage, very similar for US and European organizations.

Exhibit IV-7

Current Importance of Internet Access Characteristics, Worldwide

Characteristic	Importance
National coverage	4.5
Reliability/uptime	4.4
Service continuity	3.8
Backbone architecture	3.7
Commitment to improve/upgrade	3.6
Service level agreements	3.5
Customer service	3.3
Cost	3.1
Size of organization	2.8
International coverage	2.7
Openness of information	2.4
Focus on business market	1.6

Scale: 1 Low — 3 Importance — 5 High
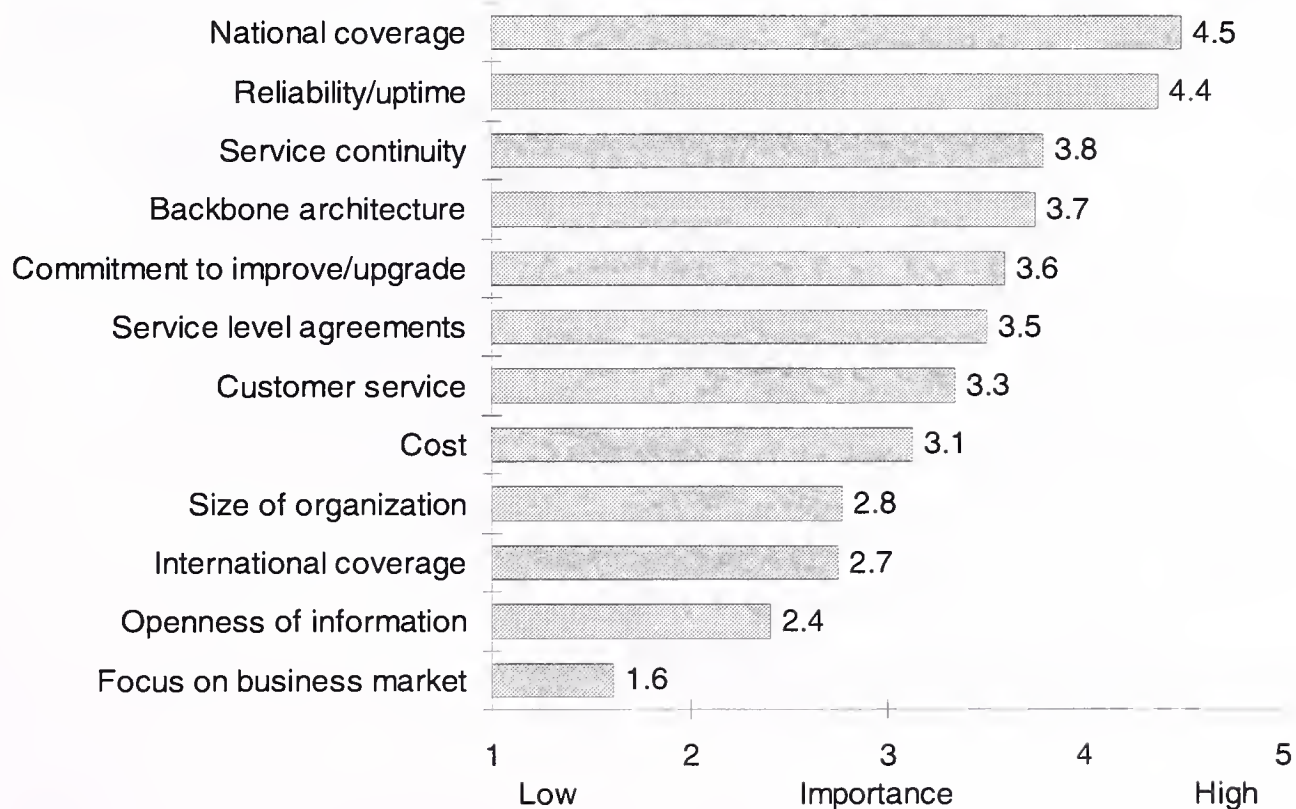
Sample: 121

Source: INPUT

Exhibit IV-8

Current Importance of Internet Access Characteristics, US

National coverage — 4.6
Reliability/uptime — 4.4
Service continuity — 4.1
Backbone architecture — 4.0
Commitment to improve/upgrade — 3.9
Service level agreements — 3.8
Customer service — 3.7
Cost — 3.2
Size of organization — 3.1
Openness of information — 2.6
International coverage — 2.2
Focus on business market — 1.7

1 — Low   2   3 — Importance   4   5 — High
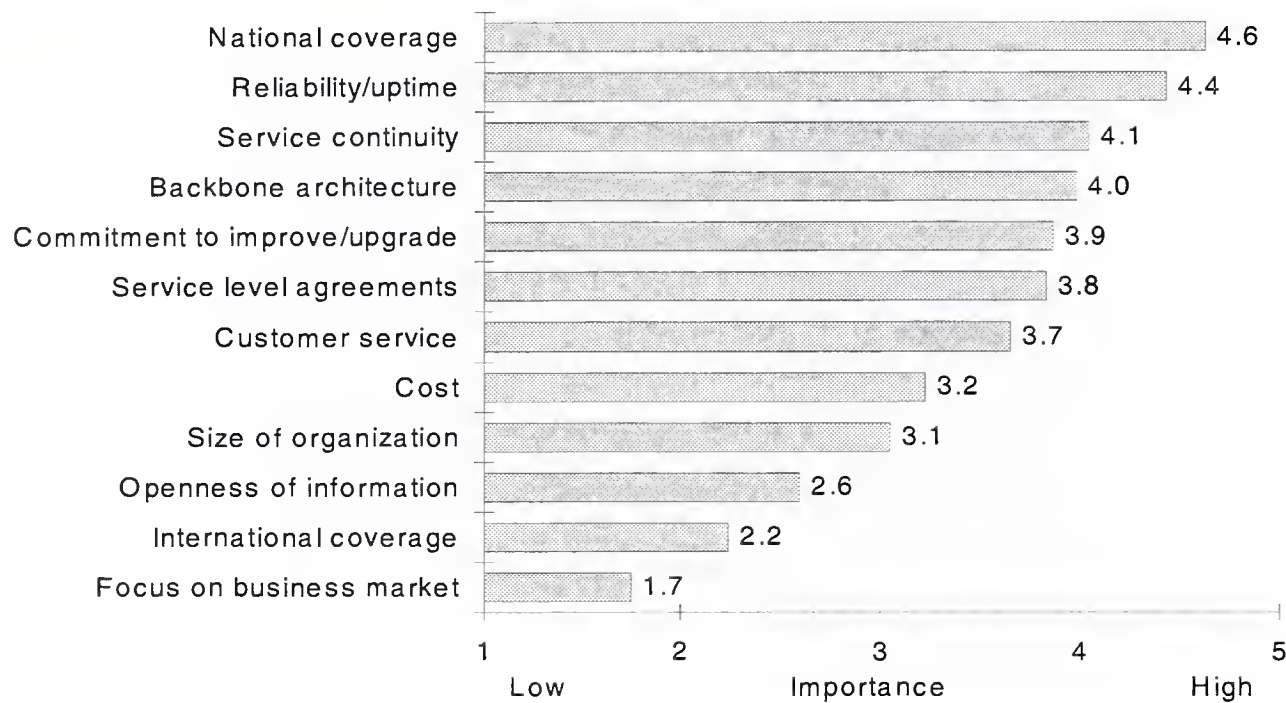
Sample: 60

Source: INPUT

Exhibit IV-9

Current Importance of Internet Access Characteristics, Europe

National coverage — 4.4
Reliability/uptime — 4.3
Service continuity — 3.5
Backbone architecture — 3.5
Commitment to improve/upgrade — 3.3
International coverage — 3.3
Service level agreements — 3.2
Customer service — 3.0
Cost — 3.0
Size of organization — 2.5
Openness of information — 2.2
Focus on business market — 1.5

1 — Low   2   3 — Importance   4   5 — High
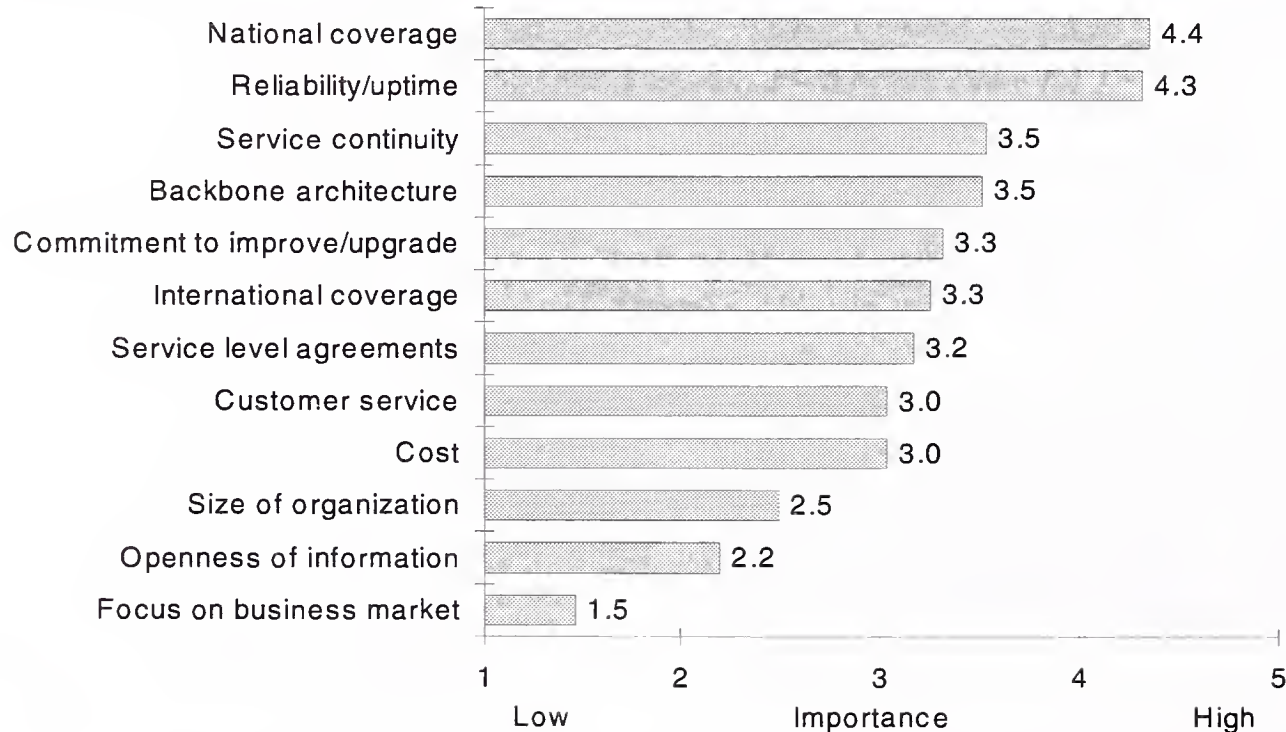
Sample: 61

Source: INPUT

Exhibits IV-10 to IV-12 show how important respondents expected each component to become over the next two years. Exhibit IV-13 show the difference in importance for each characteristic.

As mentioned above, international coverage will increase in importance significantly, due primarily to the relative indifference of US respondents towards the issue currently. The two other components anticipated to change significantly, backbone architecture and commitment to improve and upgrade, are already important issues, however. By 2000, they will rank among the top issues of concern to buyers. Service continuity, a related issue, will also increase in importance to a very high level.

Reliability issues and national coverage form the core aspects of an access service that ISPs must ensure to a high level. Users consider other issues as secondary by comparison, although mostly still important.

Exhibit IV-10

Expected Importance of Internet Access Characteristics, 2000, Worldwide

Characteristic	Importance
National coverage	4.7
Reliability/uptime	4.7
Backbone architecture	4.6
Commitment to improve/upgrade	4.4
Service continuity	4.3
Service level agreements	3.8
Customer service	3.8
International coverage	3.7
Cost	3.6
Size of organization	3.0
Openness of information	2.6
Focus on business market	1.9

Scale: 1 Low — 3 Importance — 5 High
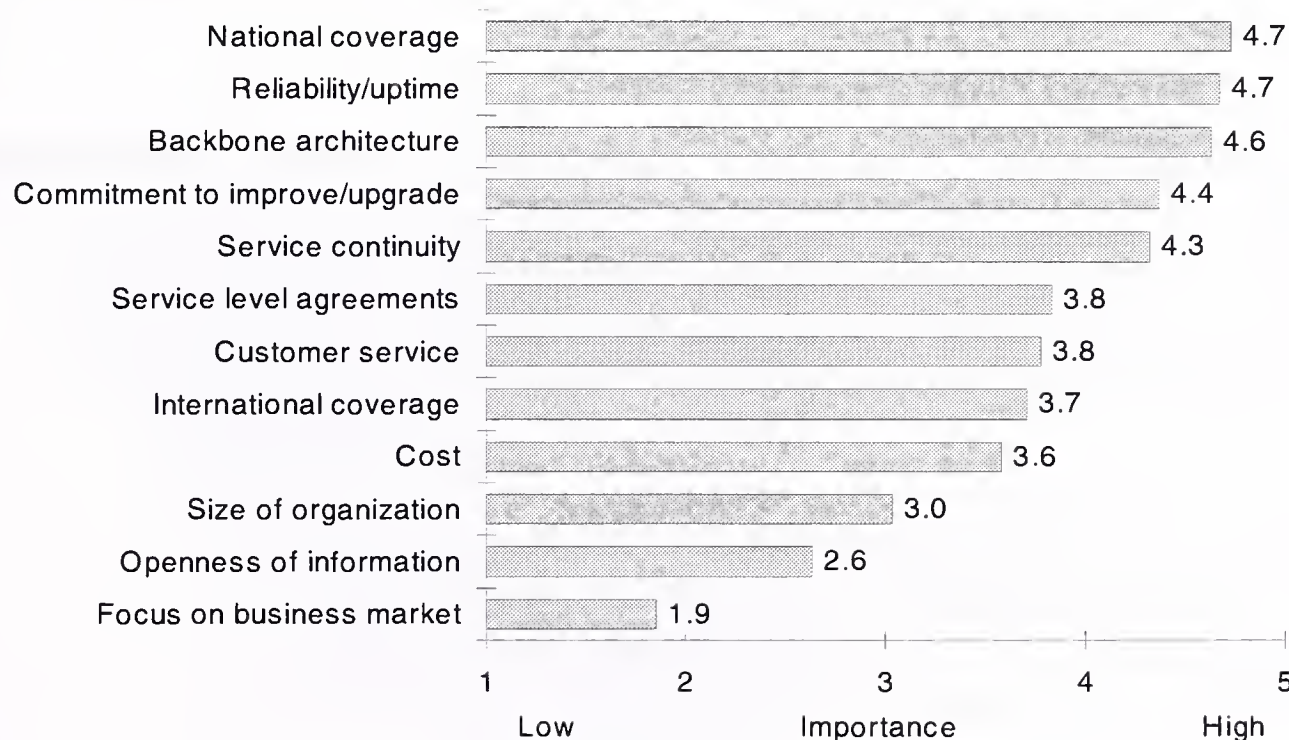
Sample: 118

Source: INPUT

Exhibit IV-11

Expected Importance of Internet Access Characteristics, 2000, US

Characteristic	Value
National coverage	4.8
Backbone architecture	4.7
Reliability/uptime	4.6
Commitment to improve/upgrade	4.5
Service continuity	4.4
Service level agreements	4.1
Customer service	4.0
Cost	3.7
International coverage	3.4
Size of organization	3.3
Openness of information	2.8
Focus on business market	1.9

Scale: 1 (Low) — Importance — 5 (High)
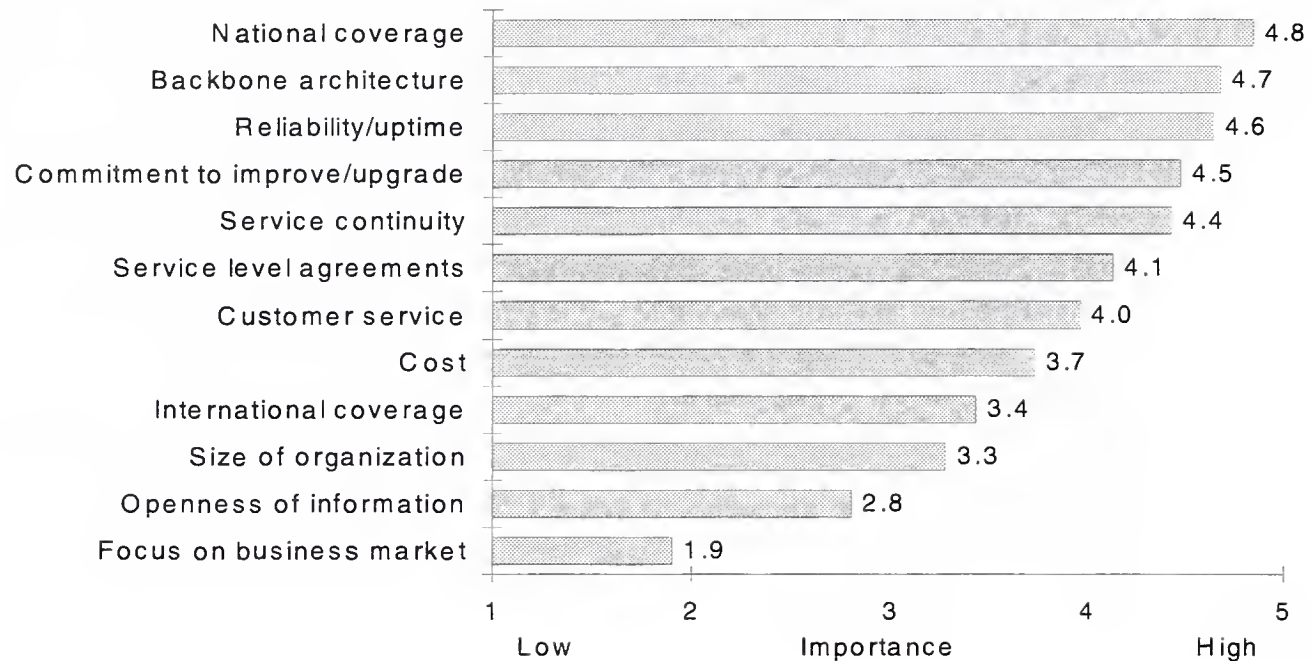
Sample: 59

Source: INPUT

Exhibit IV-12

Expected Importance of Internet Access Characteristics, 2000, Europe

Characteristic	Value
Reliability/uptime	4.7
National coverage	4.6
Backbone architecture	4.6
Commitment to improve/upgrade	4.3
Service continuity	4.2
International coverage	4.0
Customer service	3.6
Service level agreements	3.5
Cost	3.4
Size of organization	2.8
Openness of information	2.5
Focus on business market	1.8

Scale: 1 (Low) — Importance — 5 (High)
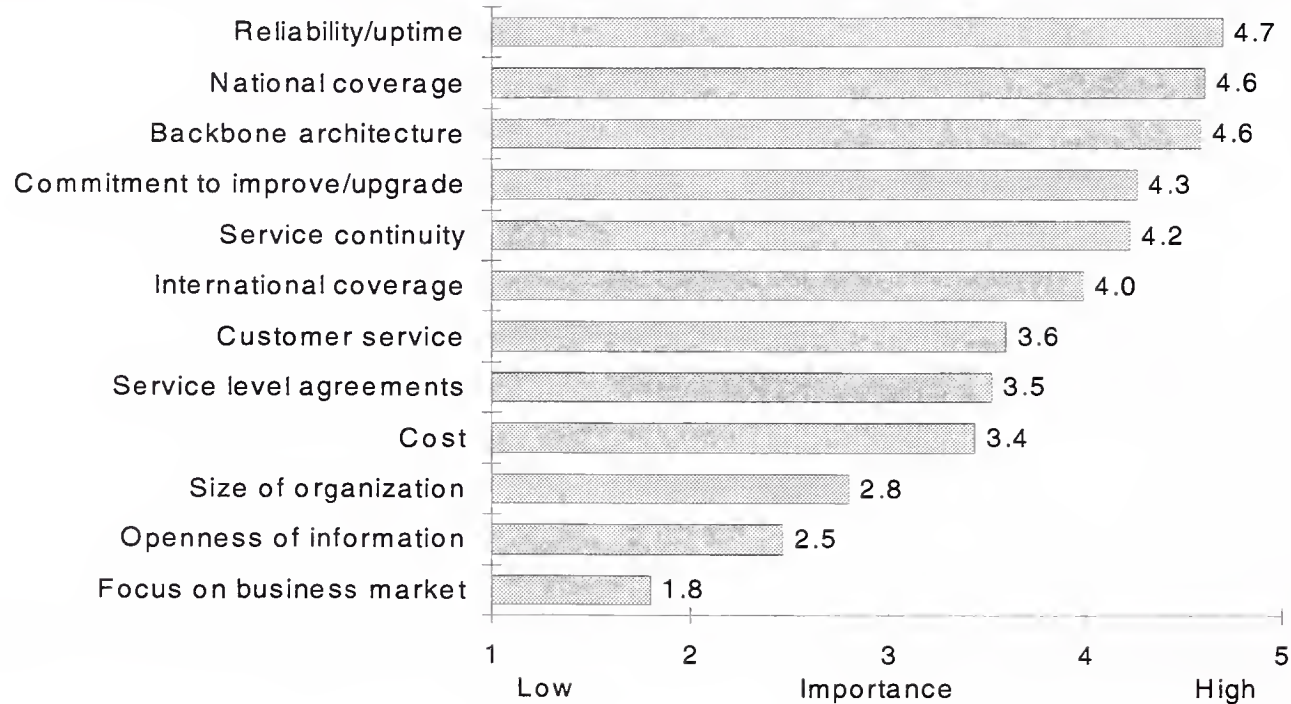
Sample: 59

Source: INPUT

Exhibit IV-13

Expected Change in Importance of Internet Access Characteristics, Worldwide

International coverage — 1.0
Backbone architecture — 0.9
Commitment to improve/upgrade — 0.8
Service continuity — 0.5
Cost — 0.5
Customer service — 0.4
Service level agreements — 0.3
Reliability/uptime — 0.3
Size of organization — 0.3
Focus on business market — 0.2
Openness of information — 0.2
National coverage — 0.2

0.0   0.2   0.4   0.6   0.8   1.0   1.2

Expected Change in Importance
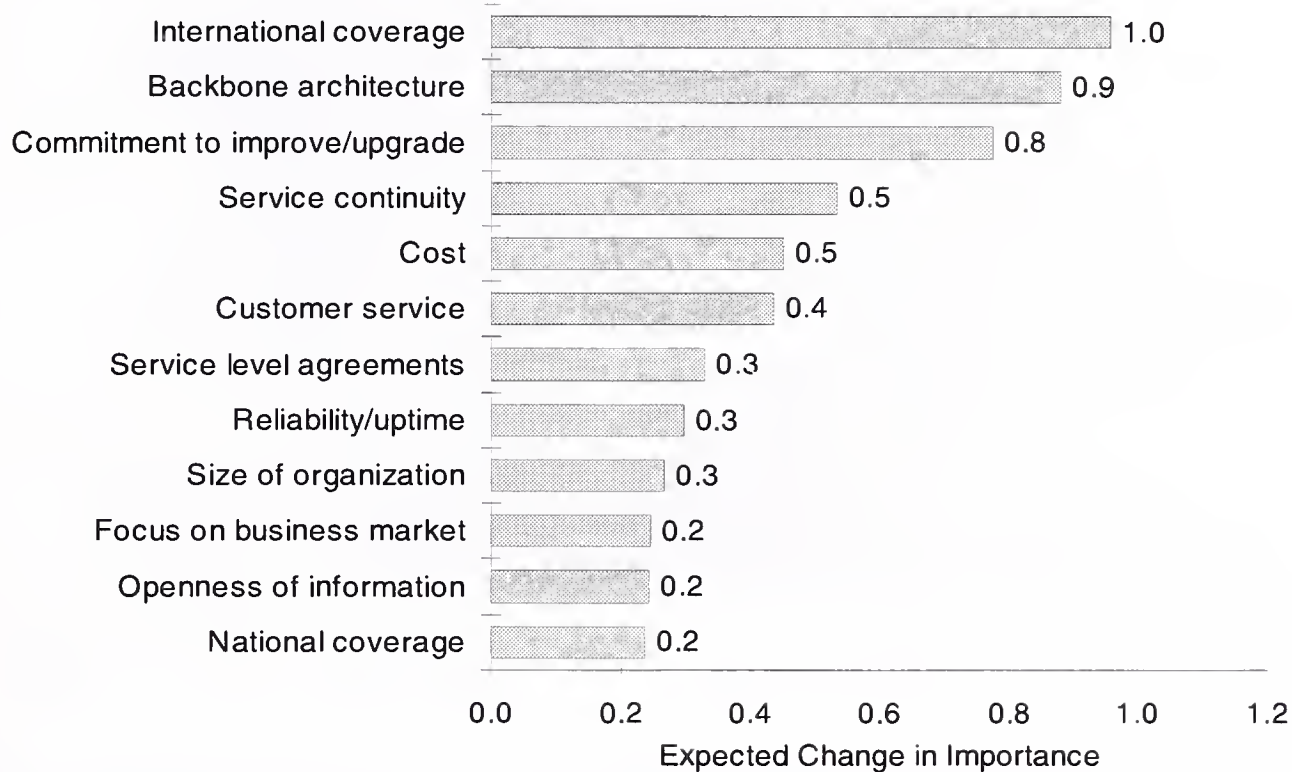
Sample: 121

Source: INPUT

Buyers are reasonably satisfied with most aspects of their access services. The most critical components highlighted above all receive ratings of 3.7 or higher across the US and Europe, with US respondents again giving higher ratings overall. For both sets of respondents, the lowest-rated characteristics are also the least important.

Exhibits IV-14 to IV-16 show the satisfaction ratings given; Exhibit IV-17 shows the difference between the importance currently given to each characteristic and the satisfaction rating received. No service component performs badly compared with its importance, and most important issues are well balanced.

Exhibit IV-14

Satisfaction With Internet Access Characteristics, Worldwide

Characteristic	Rating
National coverage	4.3
Reliability/uptime	4.2
Size of organization	3.9
Service continuity	3.8
Backbone architecture	3.8
International coverage	3.7
Commitment to improve/upgrade	3.7
Service level agreements	3.7
Customer service	3.5
Cost	3.4
Openness of information	3.2
Focus on business market	3.1

Scale: 1 Low — 2 — 3 Satisfaction — 4 — 5 High
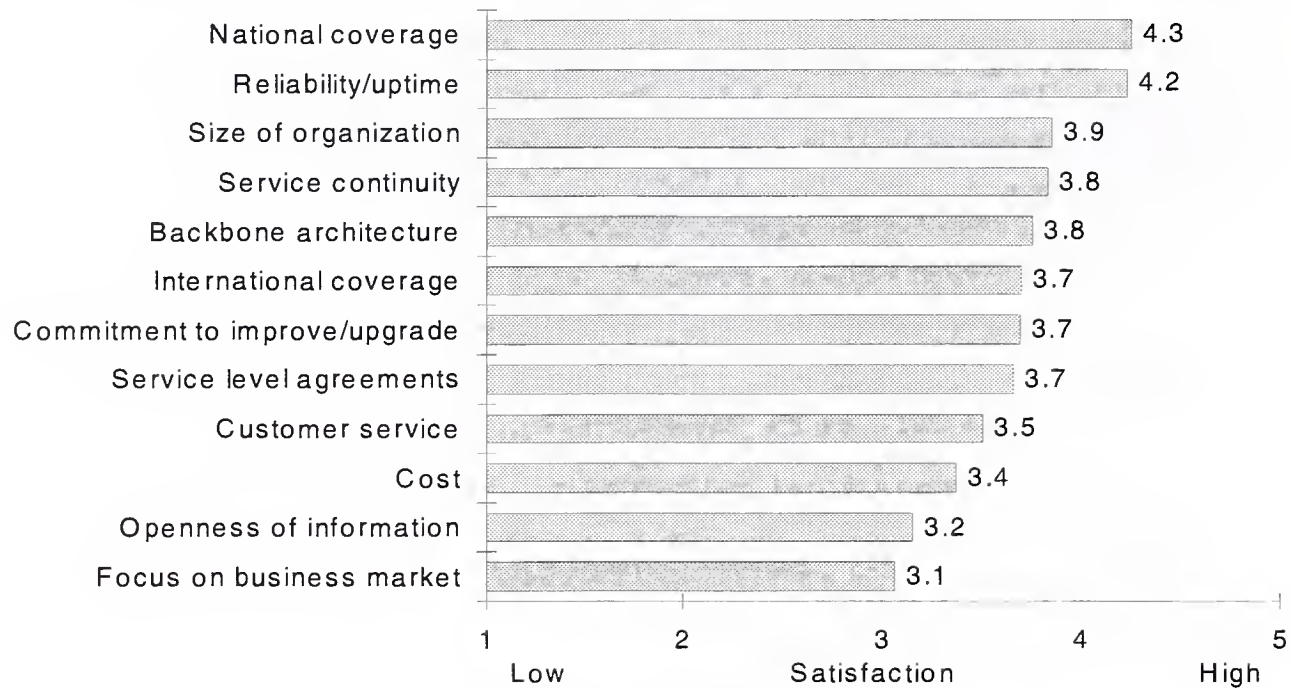
Sample: 118

Source: INPUT

Exhibit IV-15

Satisfaction With Internet Access Characteristics, US

Characteristic	Rating
National coverage	4.4
Reliability/uptime	4.4
Service continuity	4.1
Size of organization	4.0
Backbone architecture	3.9
Service level agreements	3.9
Commitment to improve/upgrade	3.8
International coverage	3.6
Customer service	3.6
Cost	3.5
Openness of information	3.2
Focus on business market	3.0

Scale: 1 Low — 2 — 3 Satisfaction — 4 — 5 High
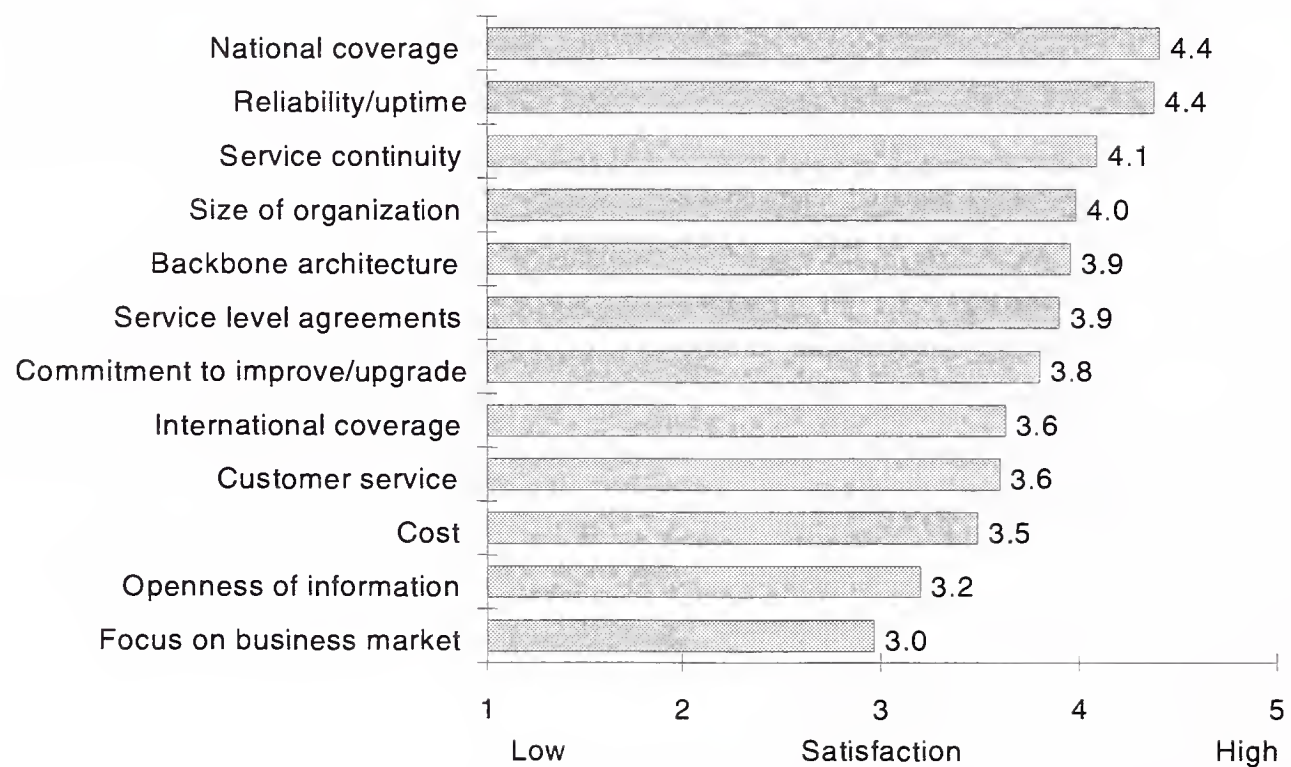
Sample: 59

Source: INPUT

Exhibit IV-16

Satisfaction With Internet Access Characteristics, Europe

Characteristic	Value
National coverage	4.1
Reliability/uptime	4.1
International coverage	3.8
Size of organization	3.7
Commitment to improve/upgrade	3.6
Service continuity	3.6
Backbone architecture	3.6
Service level agreements	3.4
Customer service	3.4
Cost	3.3
Focus on business market	3.2
Openness of information	3.1

Scale: 1 (Low) — 2 — 3 (Satisfaction) — 4 — 5 (High)
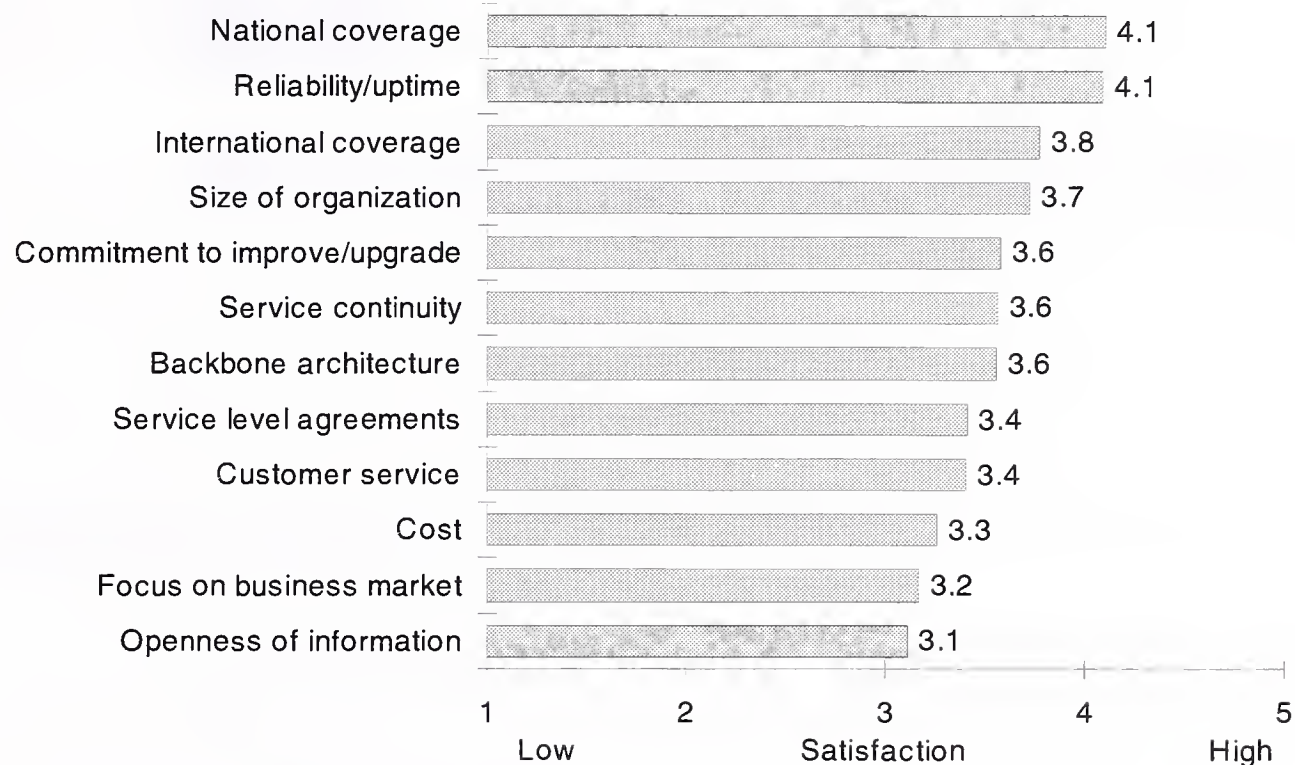
Sample: 59

Source: INPUT

Exhibit IV-17

Difference Between Importance of and Satisfaction With Internet Access Characteristics, Worldwide

Characteristic	Value
Focus on business market	1.5
Size of organization	1.1
International coverage	1.0
Openness of information	0.8
Cost	0.2
Customer service	0.2
Service level agreements	0.2
Commitment to improve/upgrade	0.1
Service continuity	0.0
Backbone architecture	0.0
Reliability/uptime	-0.1
National coverage	-0.2

Scale: -0.5 (Worse) — 0.0 — 0.5 — 1.0 (Satisfaction vs Importance) — 1.5 — 2.0 (Better)
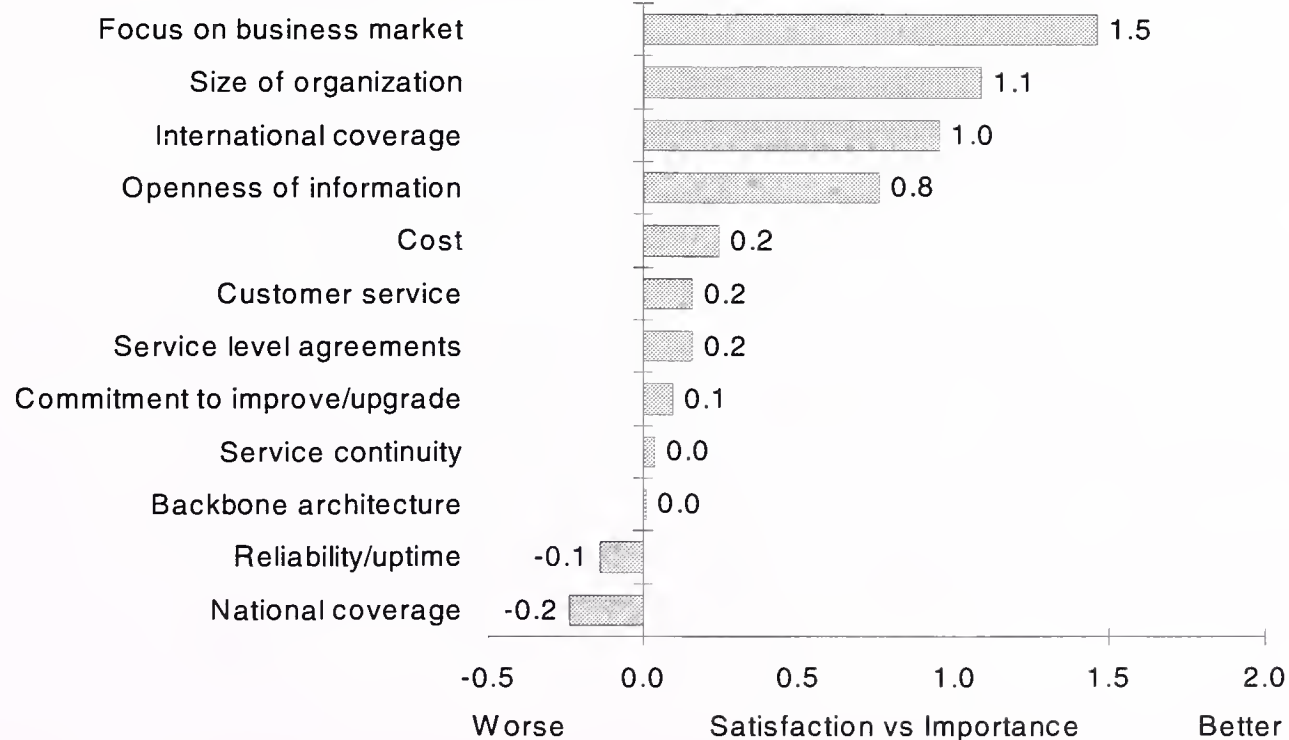
Sample: 121

Source: INPUT

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V
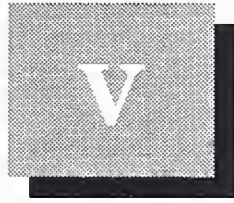
Web Hosting Usage and Plans

A

Current and Future Usage

As shown earlier in this report, use of ISP services both currently and expected by 2000 is, in descending order of penetration:

- Web server hosting

- Application server hosting

- Extranet services

Within the hosting categories, Exhibits V-1 to V-3 break down the individual hosting services offered by ISPs and show current and future usage levels.

Expected usage by 2000 is similar across the US and Europe, but current levels are comparatively higher in the US, reflecting the higher growth rates in the European ISP market compared with the US.

Buyers do not see a substantial difference between application/database server hosting and private Intranet server hosting. In practice, the two categories overlap. All software applications, from groupware and office suite packages to enterprise applications are becoming Web-enabled. In doing so, they become inherently Intranet-enabled. The difference between an in-house Intranet server and application server is decreasing and for marketing purposes will not remain a useful difference beyond 2000.

The same convergence is happening with network and application server operating systems. For example, where Novell Netware was once used as a network (primarily file and print) server, it is now both an application

(including Intranet) and a network server. Windows NT is, similarly, both a network and application server operating system.

As a result, many users mean the same thing by Intranet and application server, and so very similar usage levels are reported.

Relative use of application/Intranet hosting services and commerce hosting services is expected to remain similar over the next two years. INPUT expects growth in commerce services to overtake growth in application hosting services from 2000 onwards, as Internet commerce itself increases sharply, due to resolution of payment mechanisms, greater acceptance of online commerce, and increased business and consumer Internet population.

Exhibit V-1

Current and Expected Use of Hosting Services, Worldwide

Public Web server — 61% / 76%

Private Intranet server — 26% / 49%

■ 1998
▨ 2000

Application/database server — 25% / 49%

Web commerce server — 17% / 39%

0%   10%   20%   30%   40%   50%   60%   70%   80%

Proportion of Respondents

Sample: 150

Source: INPUT

EI18W
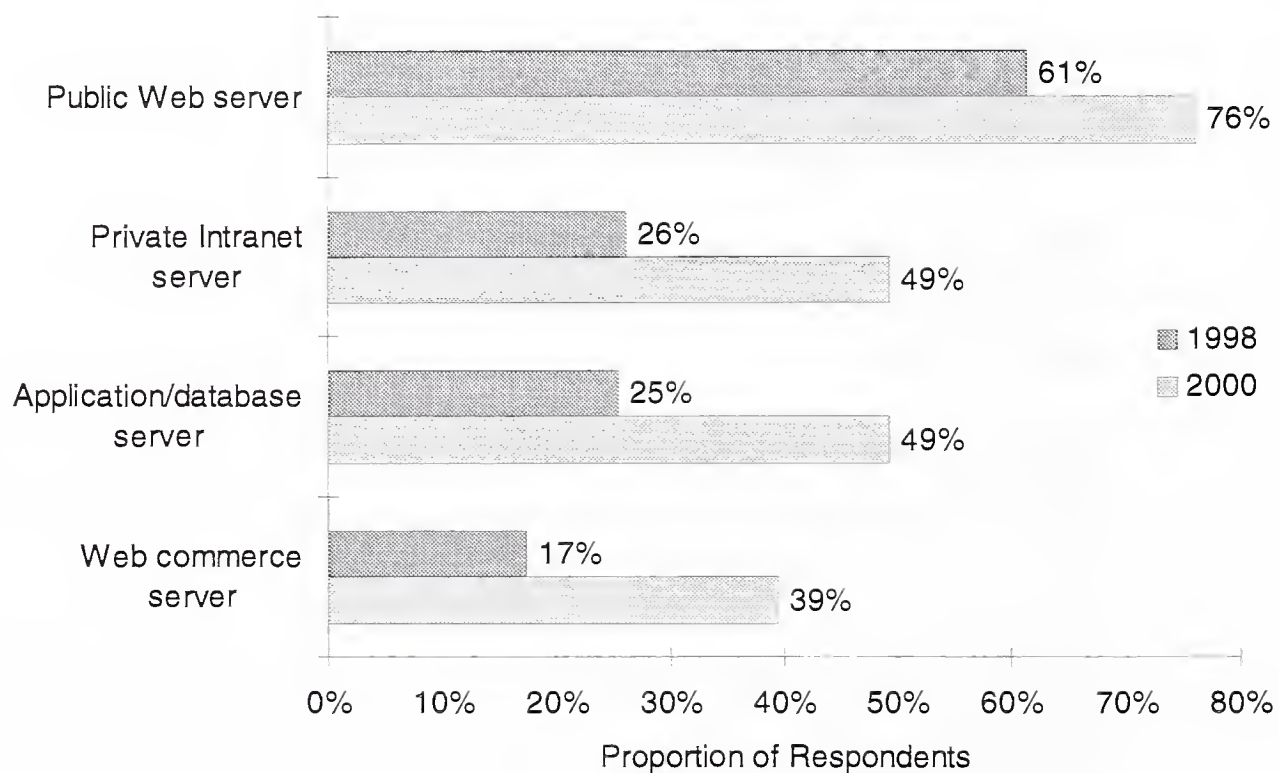
Exhibit V-2

Current and Expected Use of Hosting Services, US

Public Web server — 60% (1998), 76% (2000)
Private Intranet server — 33% (1998), 51% (2000)
Application/database server — 31% (1998), 55% (2000)
Web commerce server — 21% (1998), 43% (2000)

1998
2000

Proportion of Respondents
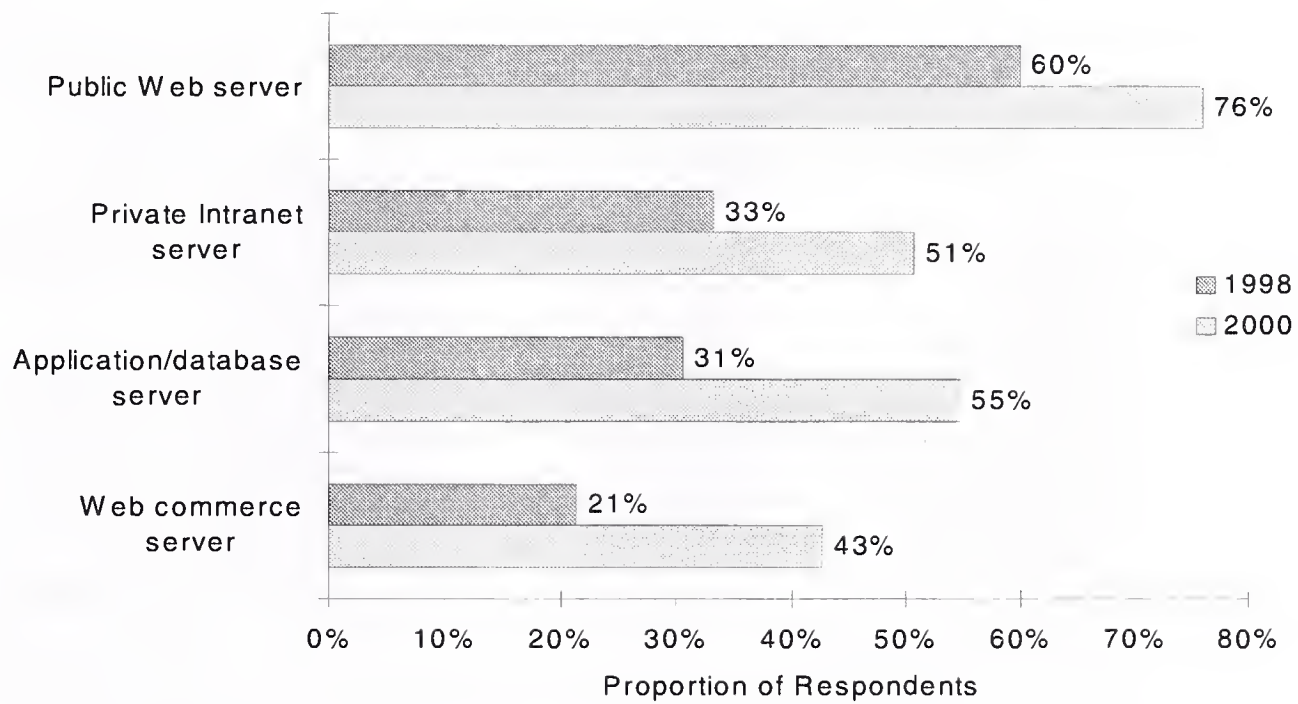
Sample: 75

Source: INPUT

Exhibit V-3

Current and Expected Use of Hosting Services, Europe

Public Web server — 63% (1998), 76% (2000)
Application/database server — 20% (1998), 44% (2000)
Private Intranet server — 19% (1998), 48% (2000)
Web commerce server — 13% (1998), 36% (2000)

1998
2000

Proportion of Respondents
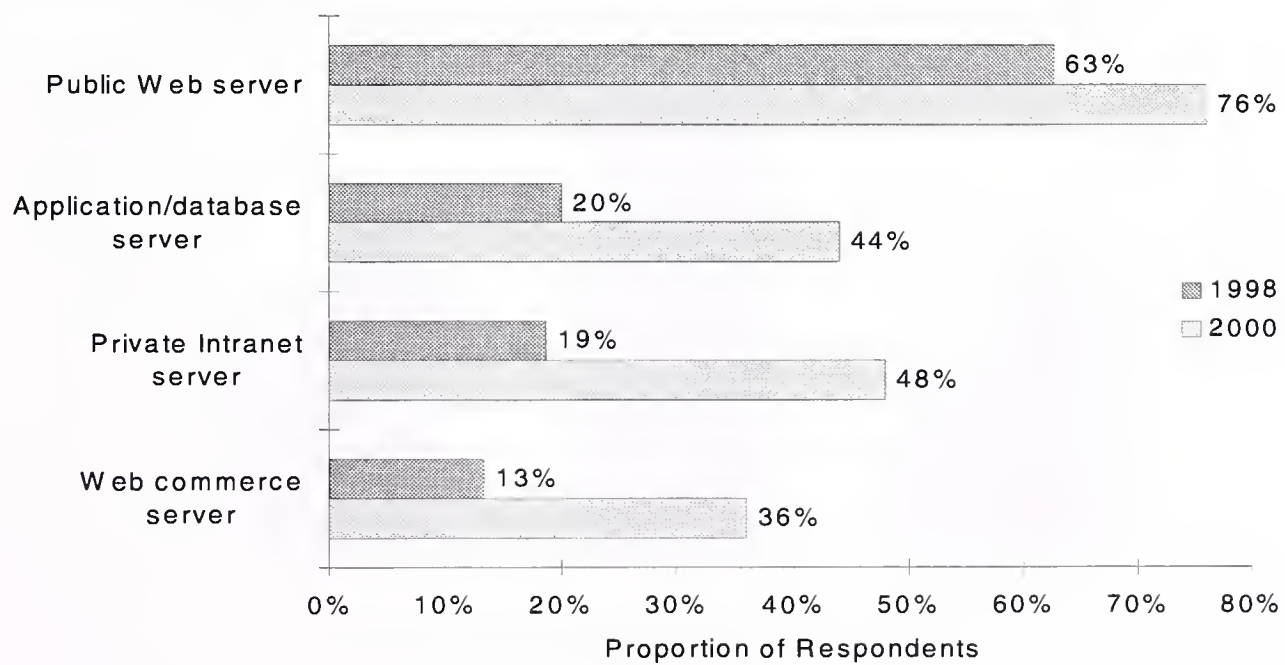
Sample: 75

Source: INPUT

B

Server Ownership

Servers are hosted in three ways:

- Shared—a customer shares a machine with other customers

- Dedicated—a customer has exclusive use of a machine

- Co-located—a customer owns a machine and sites it on an ISP's network

Exhibits V-4 to V-6 show the changing expectations of buyers regarding their use of these three options. Of respondents currently with a Web hosting service, 85% use a shared or dedicated server. The use of co-located servers will rise considerably between 1998 and 2000, as organizations rely increasingly on the Internet for advertising and marketing purposes, and for taking orders online—service guarantees, security, predictable bandwidth, scalability, and, most notably, a high level of user control are best provided by a co-location service.

Changes in server ownership are most pronounced in Europe; users expect to reduce their use of shared servers in favor of dedicated and co-located servers to meet the needs of increasingly critical and demanding Web presences. This higher growth in dedicated and co-located servers is again due to the lower current usage levels compared with the US. Expected usage by 2000 is similar across both regions.

Exhibit V-4

Current and Expected Web Server Ownership, Worldwide
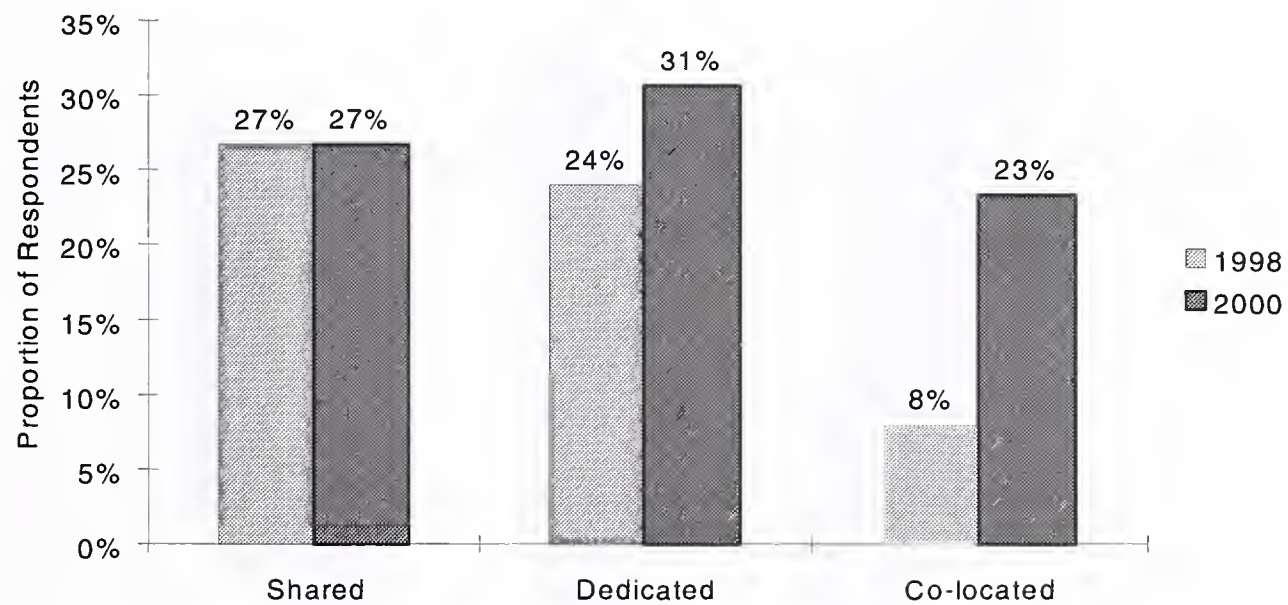
Sample: 150

Exhibit V-5

Current and Expected Web Server Ownership, US
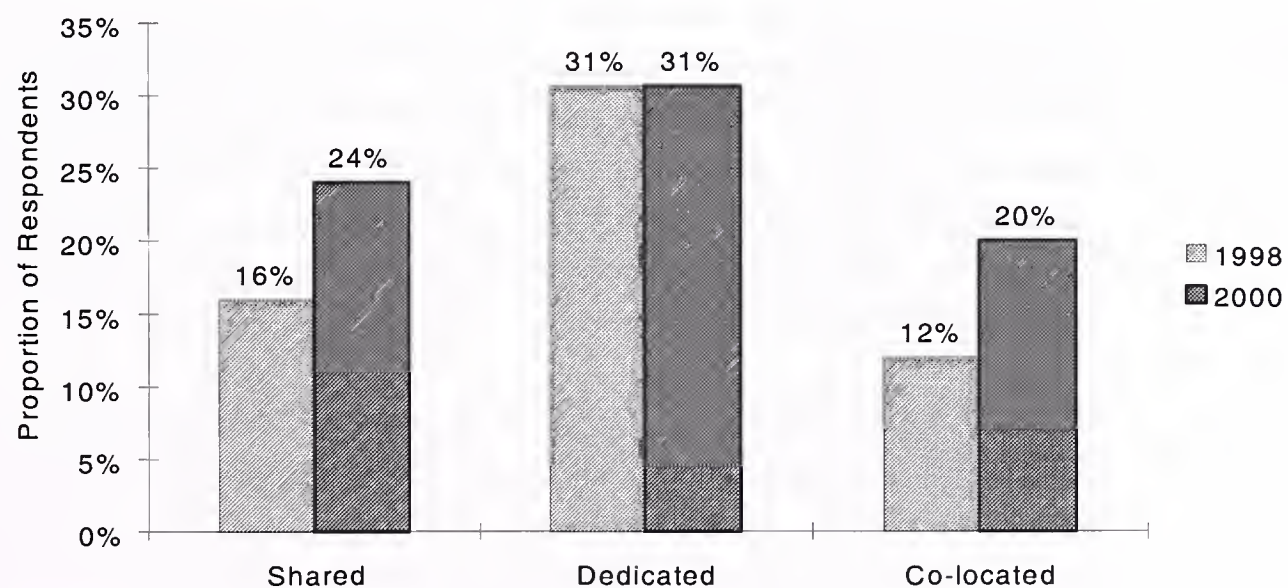
Sample: 75

Exhibit V-6

Current and Expected Web Server Ownership, Europe
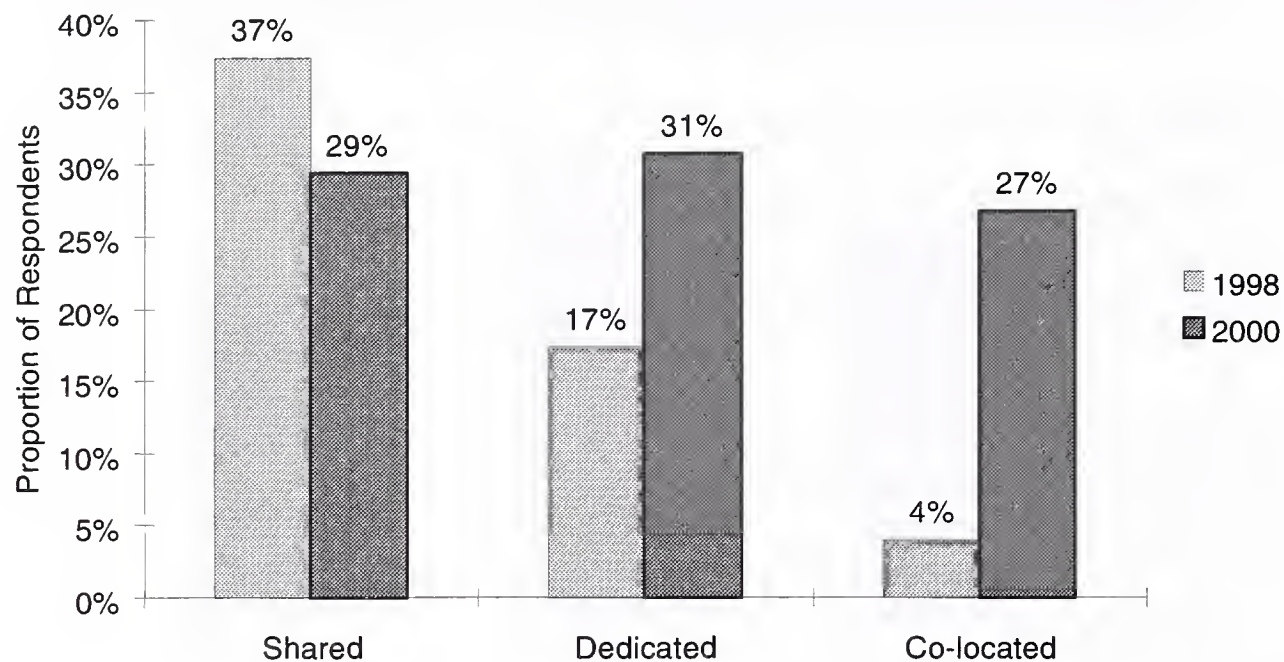
Sample: 75

C
Management Responsiblity

ISPs should prepare to accept a greater degree of management responsibility for hosted servers. Currently, as Exhibits V-7 to V-9 show, most management (system, application and content) is performed by users themselves, accessing the server remotely. ISPs are most commonly responsible for system management of hosted servers, although a small proportion of organizations let the ISP manage content as well as systems through full Web development and implementation services.

It is clear from Exhibits V-10 to V-12 that buyers want ISPs to take over more of the management role, particularly system management. This is seen as a benefit of a hosting service that currently is not being delivered according to customers' preferences. Exhibit V-13 shows the difference between current and preferred management roles, and highlights these preferences.

The market for complete managed Internet solutions will grow rapidly over the next three years and beyond, particularly within the SME sector.

The benefits of hosting services are currently largely enhancements over in-house provision, such as increased security and greater resilience, although INPUT expects unique, positive benefits to emerge that focus on the ability to conduct electronic business in new and cost-effective ways.

Exhibit V-7

Hosted Web Server Management Responsibilities, Worldwide
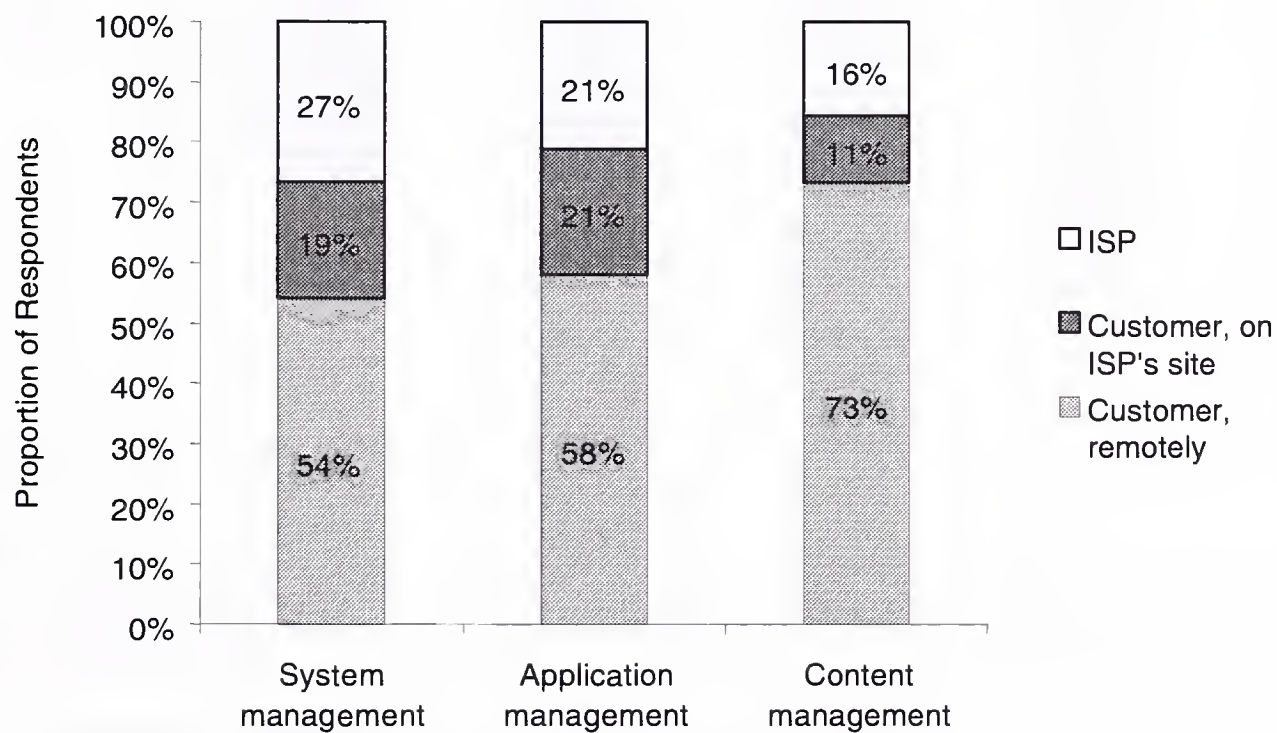
Sample: 83

Source: INPUT

Exhibit V-8

Hosted Web Server Management Responsibilities, US

Proportion of Respondents

| System management | Application management | Content management |

ISP — 21%, 16%, 14%
Customer, on ISP's site — 19%, 21%, 9%
Customer, remotely — 60%, 63%, 77%

ISP

Customer, on ISP's site

Customer, remotely
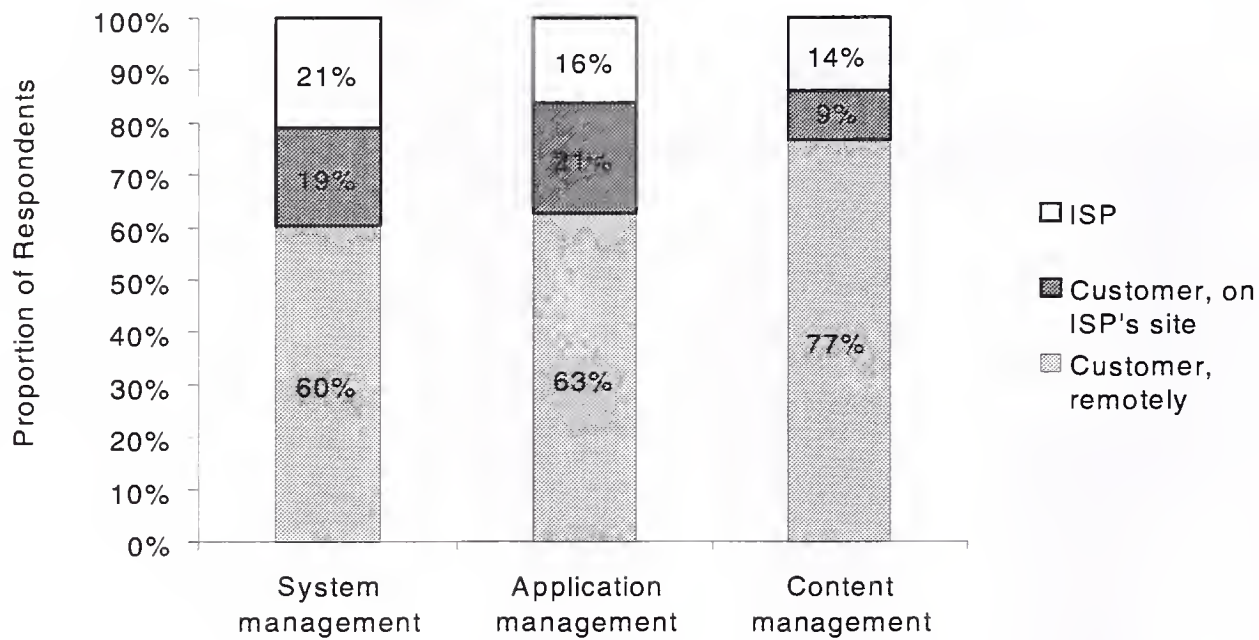
Sample: 43

Source: INPUT

Exhibit V-9

Hosted Web Server Management Responsibilities, Europe

Proportion of Respondents

| System management | Application management | Content management |

ISP — 33%, 26%, 18%
Customer, on ISP's site — 20%, 21%, 13%
Customer, remotely — 48%, 53%, 70%

ISP

Customer, on ISP's site

Customer, remotely
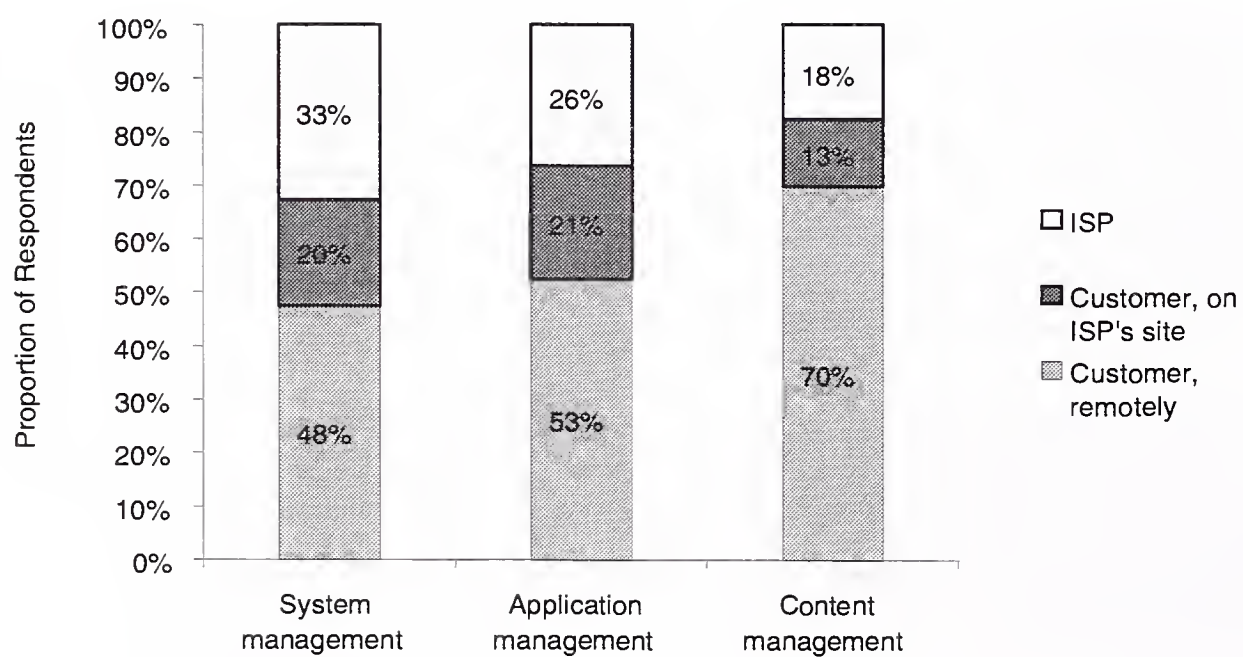
Sample: 40

Source: INPUT

Exhibit V-10

Preferred Web Hosting Management Responsibilities, Worldwide
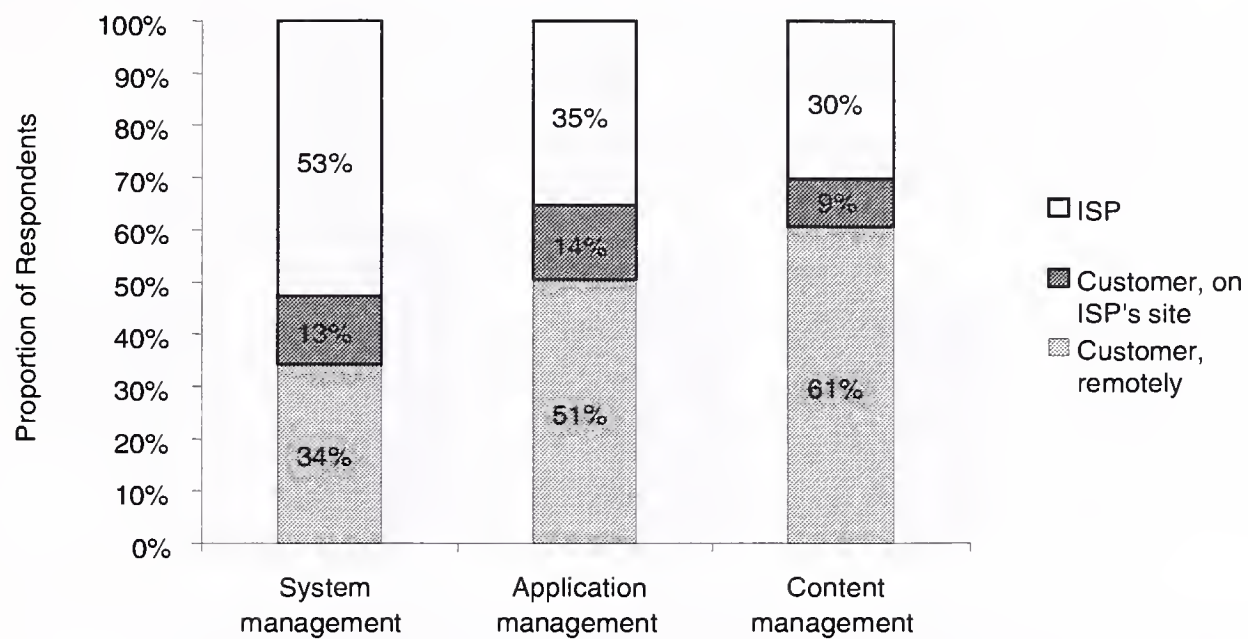
Sample: 99

Source: INPUT

Exhibit V-11

Preferred Web Hosting Management Responsibilities, US
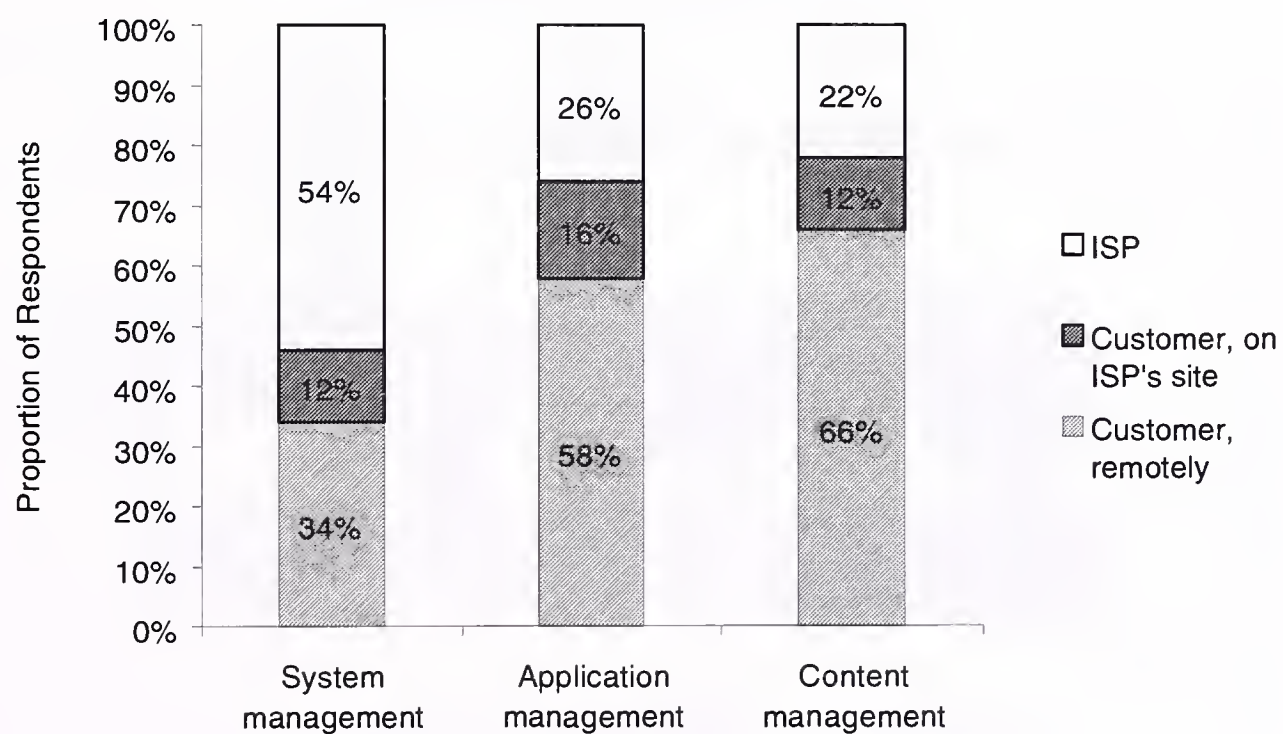
Sample: 50

Source: INPUT

Exhibit V-12

Preferred Web Hosting Management Responsibilities, Europe
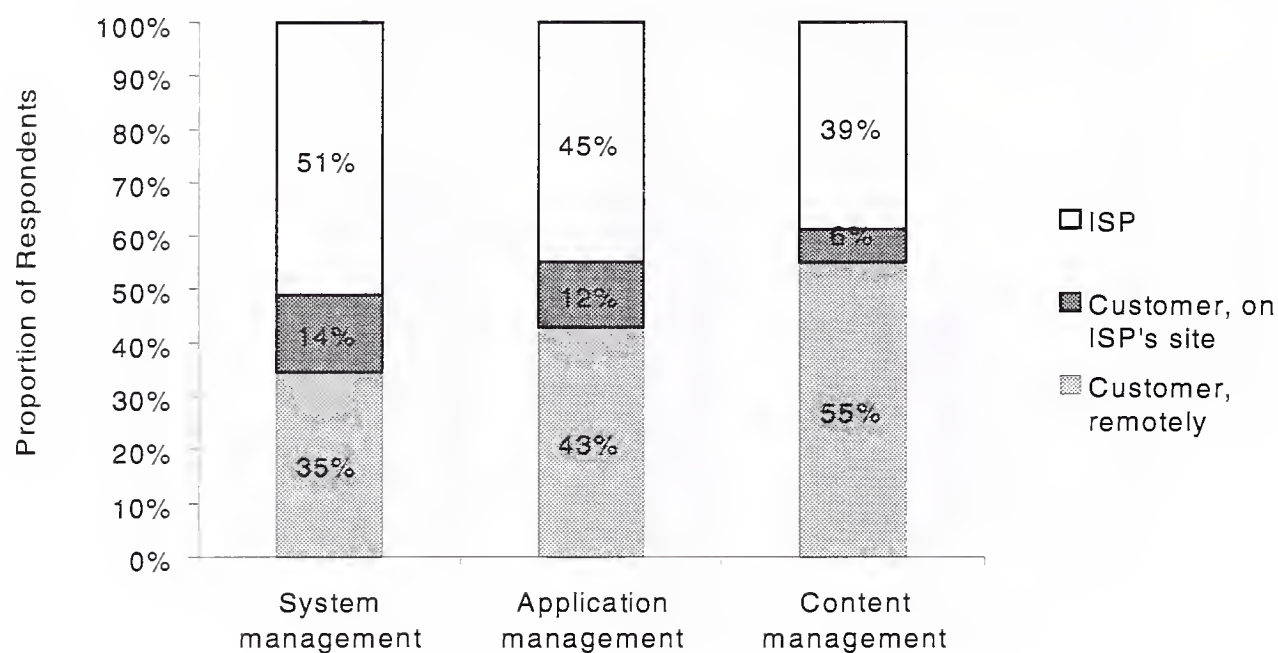
Sample: 49

Exhibit V-13

Difference Between Current and Preferred Web Hosting Management Responsibilities, Worldwide
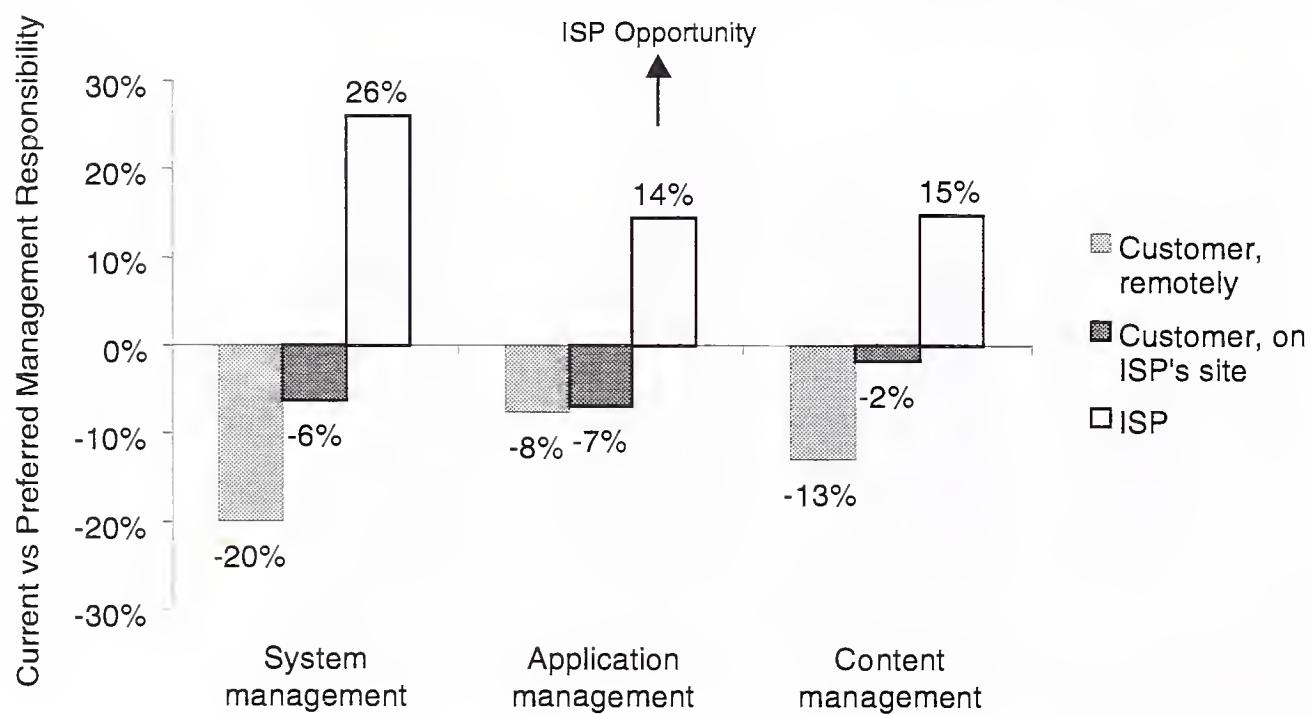
Sample: 99

D
ISP Consistency

Once an ISP has negotiated a contract to supply a customer with Internet access, it must press further to supply additional services and not expect the customer to operate a one-stop-shop policy. Exhibit V-14 shows that many organizations seek alternative suppliers of Web hosting services, particularly in the US.

Customer turnover in the ISP market is high, due largely to the relative ease with which users can change suppliers. The same factor enables users to mix and match providers for individual services, in many cases obtaining better deals through such an approach than by purchasing an integrated service from a single ISP.

The two reasons given by respondents for using separate ISPs for Internet access and Web hosting, given in equal measure, were:

- The organization's current ISP did not provide a Web hosting service, or was limited in its offering

- The organization operated a 'best of breed' policy and sought suppliers for individual services

Exhibit V-14

Use of Same ISP for Internet Access and Web Hosting
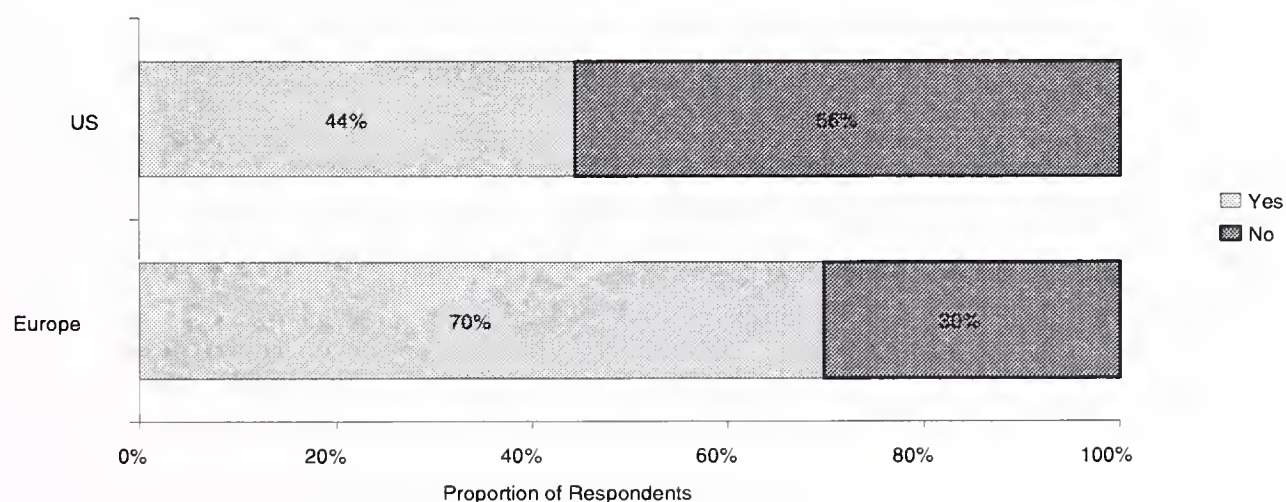
Sample: 88

Source: INPUT

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VI
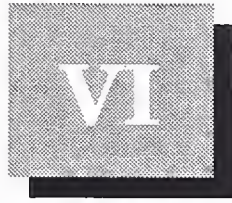
Web Hosting Benefits, Satisfaction, and Criteria

A
Benefits

Web hosting services enable organizations to enhance the robustness of their Web presence, and stronger security and resilience are perceived as the greatest benefits of Web hosting, well above the reduction in internal administration and network load that in-house Web servers incur.

These most significant benefits have been realized to a moderate degree, but with security in particular, in both the US and Europe, buyers seek improvements. Security of public Web sites is a contentious issue, with several (well publicized) cases of high-profile site breaches such as the US CIA site and the UK Labour Party site. Such highly-visible break-ins raise concerns among many users over the current viability of the Web as a secure environment for business, notably for commerce. Users do not feel assured that they will achieve greater levels of security by using a hosting service compared to in-house provision.

ISPs should look to all of the areas shown for improvement and publicize their improvements, particularly in security. Inevitably, buyers will be more attracted to a service that can demonstrate long-term resilience to break-in attempts than to one that has suffered high-profile breaches.

Exhibit VI-1

Web Hosting Benefits, Worldwide

Stronger security — 4.0 / 3.3
Increased resilience — 3.9 / 3.6
Swifter problem resolution — 3.8 / 3.5
Increased functionality — 3.6 / 3.3
Cost savings — 3.3 / 3.2
Reduced management — 2.9 / 2.8
Reduced network traffic — 2.8 / 2.9

Significance
Realization

1   2   3   4   5
Low   Significance/Realization   High
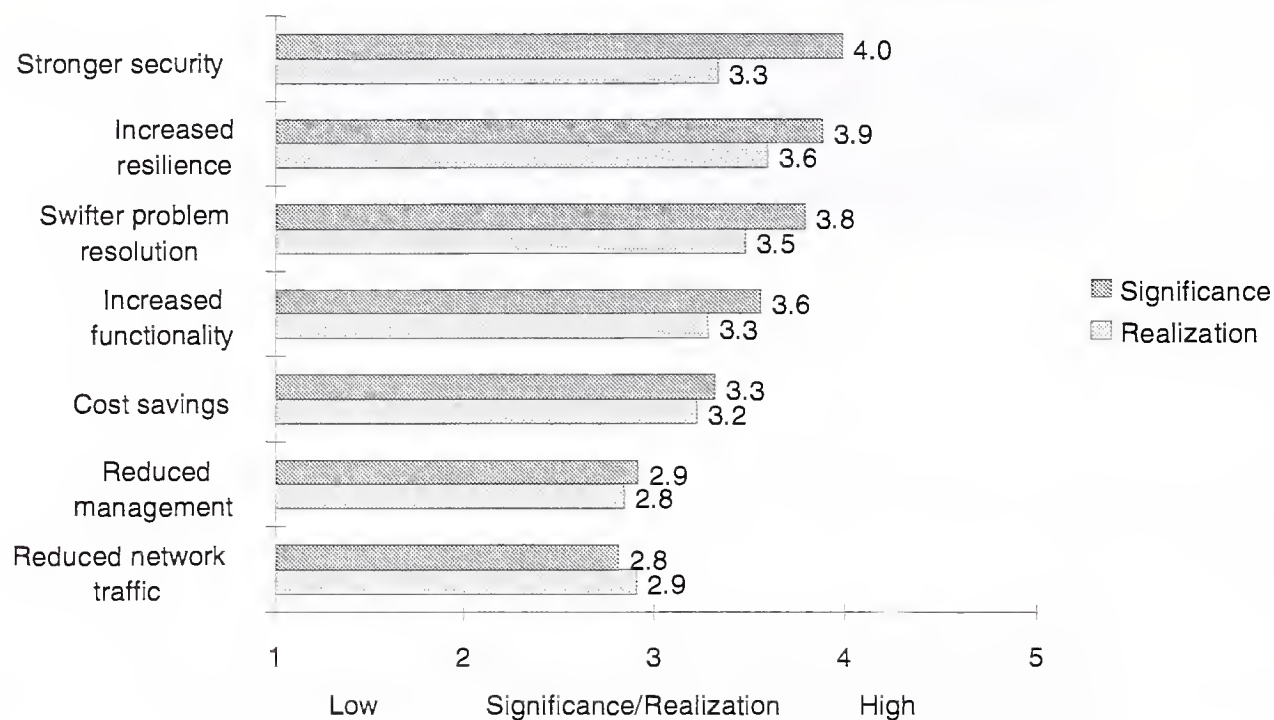
Sample: 123

Source: INPUT

Exhibit VI-2

Web Hosting Benefits, US

Stronger security — 4.1 / 3.4
Increased resilience — 3.9 / 3.6
Swifter problem resolution — 3.8 / 3.5
Increased functionality — 3.7 / 3.3
Cost savings — 3.5 / 3.3
Reduced management — 2.9 / 3.1
Reduced network traffic — 2.9 / 3.0

Significance
Realization

1   2   3   4   5
Low   Significance/Realization   High

Sample: 60

Source: INPUT

EI18W
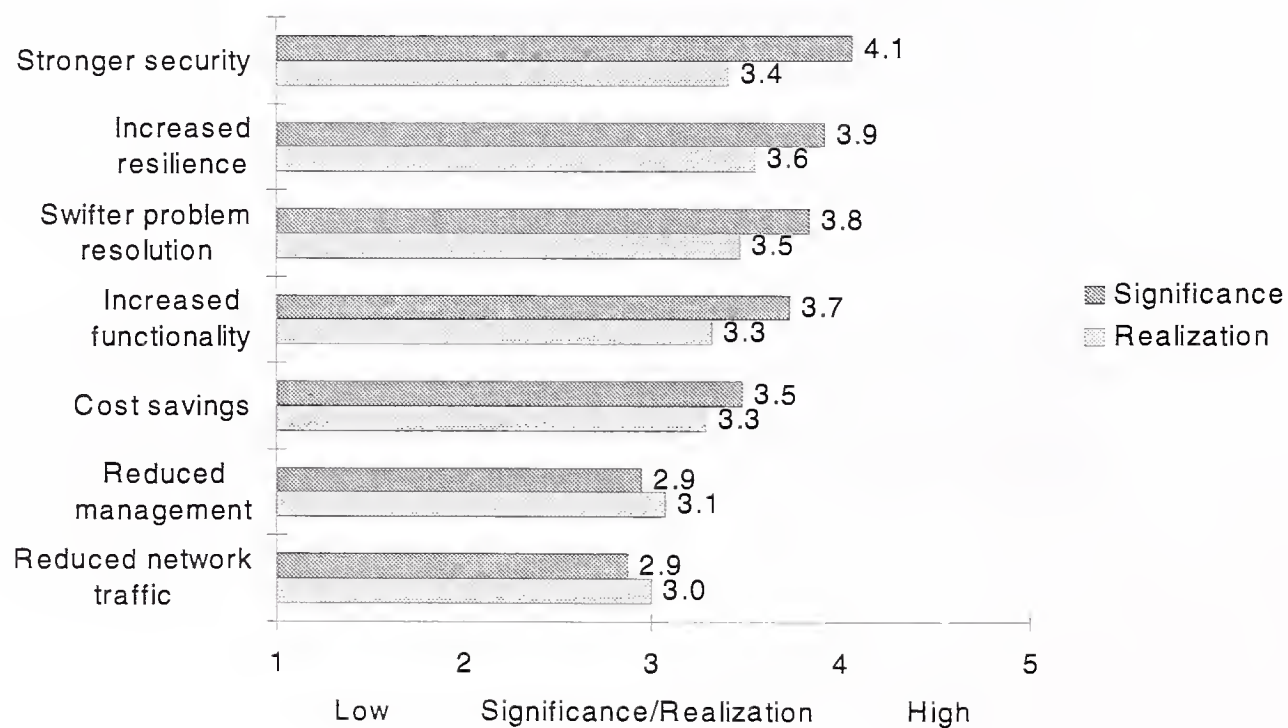
Exhibit VI-3

Web Hosting Benefits , Europe

Stronger security — Significance 3.9, Realization 3.3

Increased resilience — Significance 3.9, Realization 3.6

Swifter problem resolution — Significance 3.7, Realization 3.5

Increased functionality — Significance 3.4, Realization 3.3

Cost savings — Significance 3.2, Realization 3.2

Reduced management — Significance 2.9, Realization 2.7

Reduced network traffic — Significance 2.7, Realization 2.8

Legend: ▨ Significance ☐ Realization

X-axis: 1 (Low) — 2 — 3 Significance/Realization — 4 — 5 (High)

Sample: 63

Source: INPUT

B

Satisfaction

Exhibits VI-4 and VI-5 show the overall satisfaction ratings given by respondents to their Web hosting service by country and by industry sector. Unlike ratings for Internet access, buyers are not highly satisfied with their services—ratings pivot around the average of 3.4 in each sample segment.

Exhibit VI-4

Overall Satisfaction With Web Hosting Services, by Country

US — 3.5
World — 3.4
UK — 3.4
Europe — 3.3
Germany — 3.3
France — 3.0

| 1 | 2 | 3 | 4 | 5 |
| Low | | Satisfaction | | High |

Average: 3.4

Sample: 78

Source: INPUT
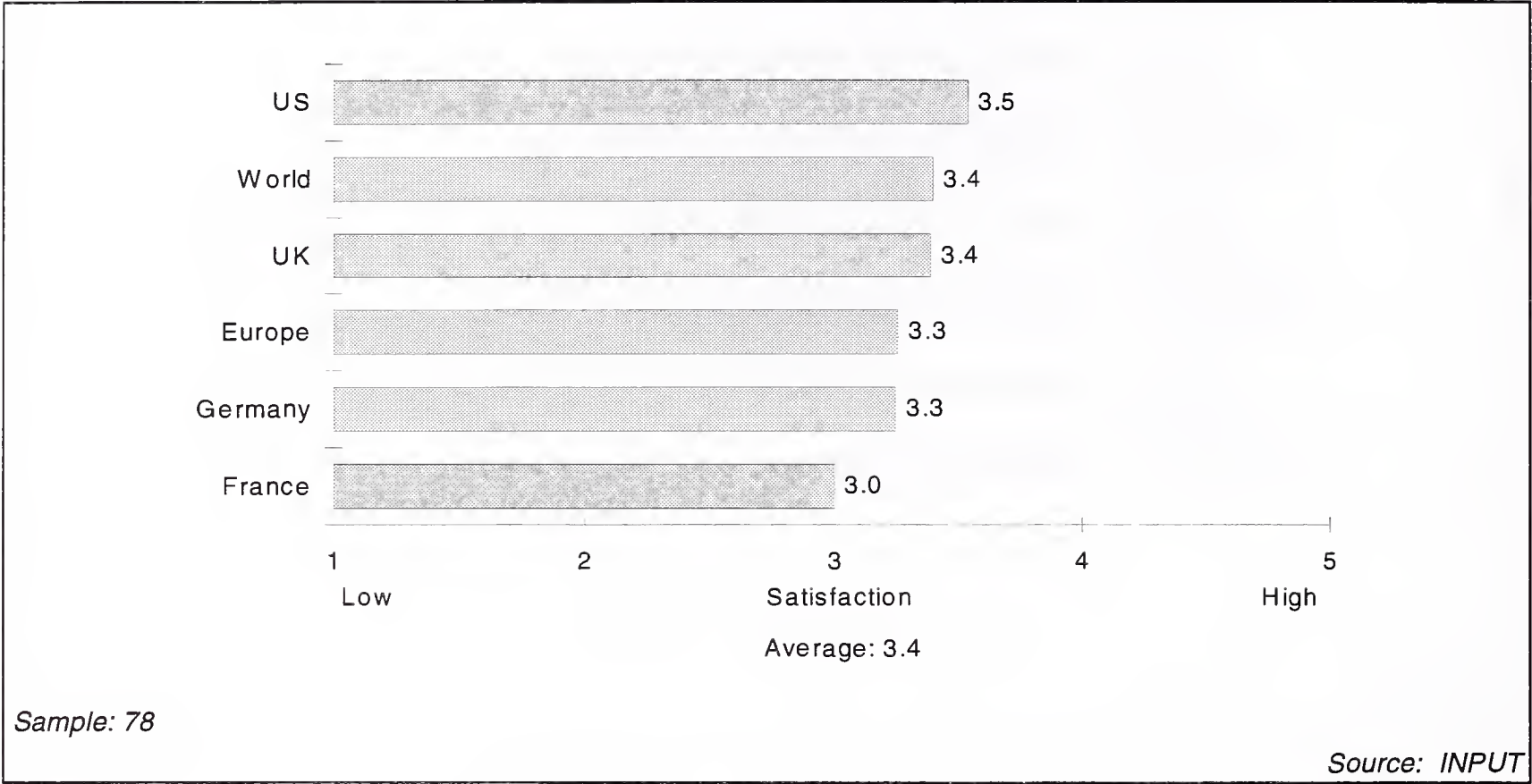
Exhibit VI-5

Overall Satisfaction With Web Hosting Services, by Industry

Retail — 3.5

Manufacturing — 3.4

Finance — 3.4

| 1 | 2 | 3 | 4 | 5 |
| Low | | Satisfaction | | High |

Average: 3.4

Sample: 78

Source: INPUT

74
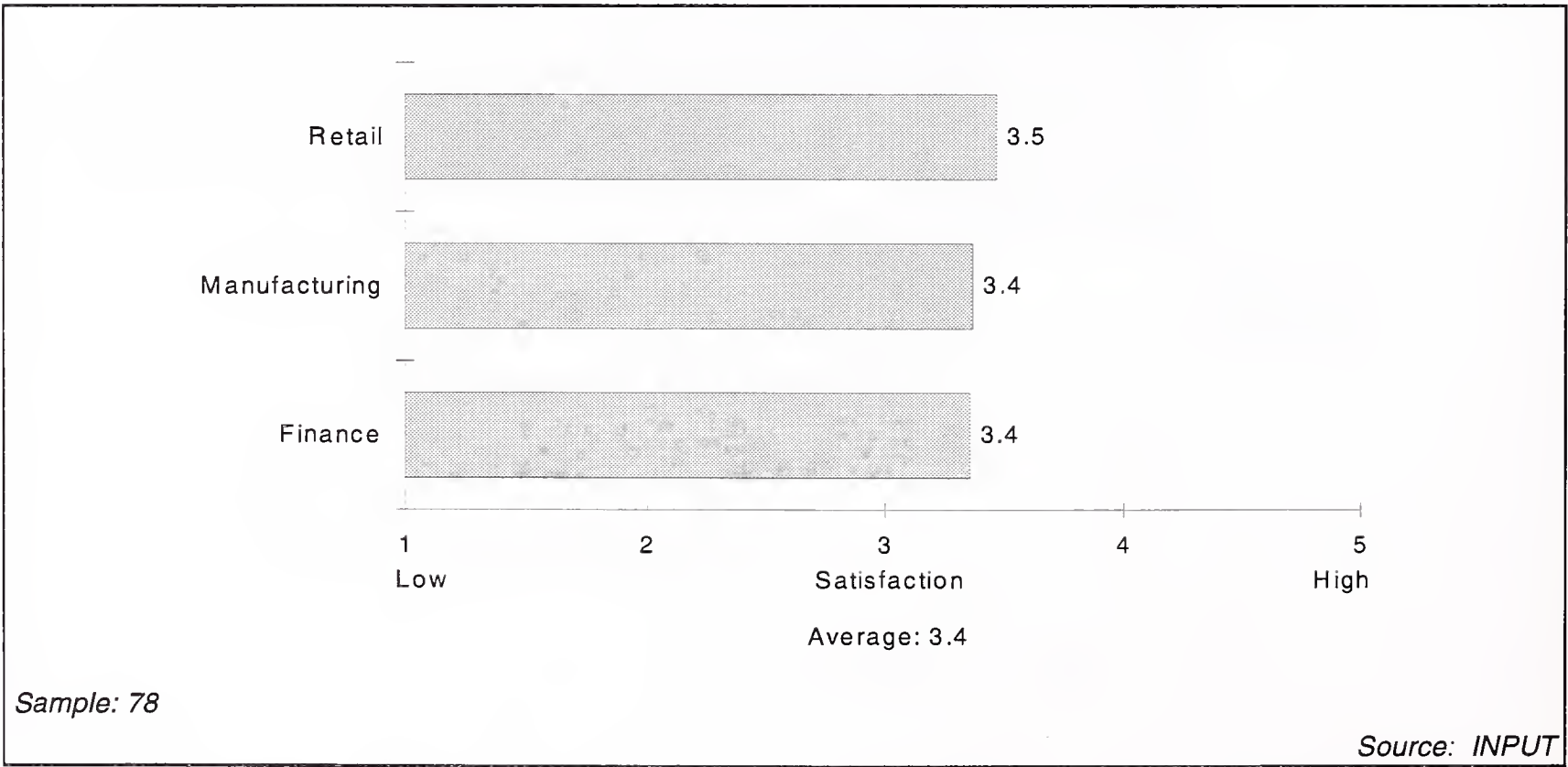
Exhibits VI-6 to VI-8 show how important respondents currently consider characteristics of Web hosting services. Reflecting the concerns discussed above, both security issues covered (application/data and physical security) are of near-maximum importance.

As with access services, buyers place great importance on a robust, stable service. Reliability, service continuity, and service level agreements are, in order, the three most important issues after security for both US and European companies. To meet the requirements of Web sites increasingly critical to organizations' business, ISPs must compete firstly on security, reliability, and availability issues.

Exhibit VI-6

Current Importance of Web Hosting Characteristics, Worldwide

Characteristic	Importance
Application/data security	4.6
Physical security	4.5
Reliability/uptime	4.3
Service continuity	3.9
Service level agreements	3.5
Server bandwidth	3.3
ISP flexibility	3.1
Scalability	3.1
Cost	3.1
ISP liability	3.1
Mirroring/replication	2.7

1 Low   2   3 Importance   4   5 High
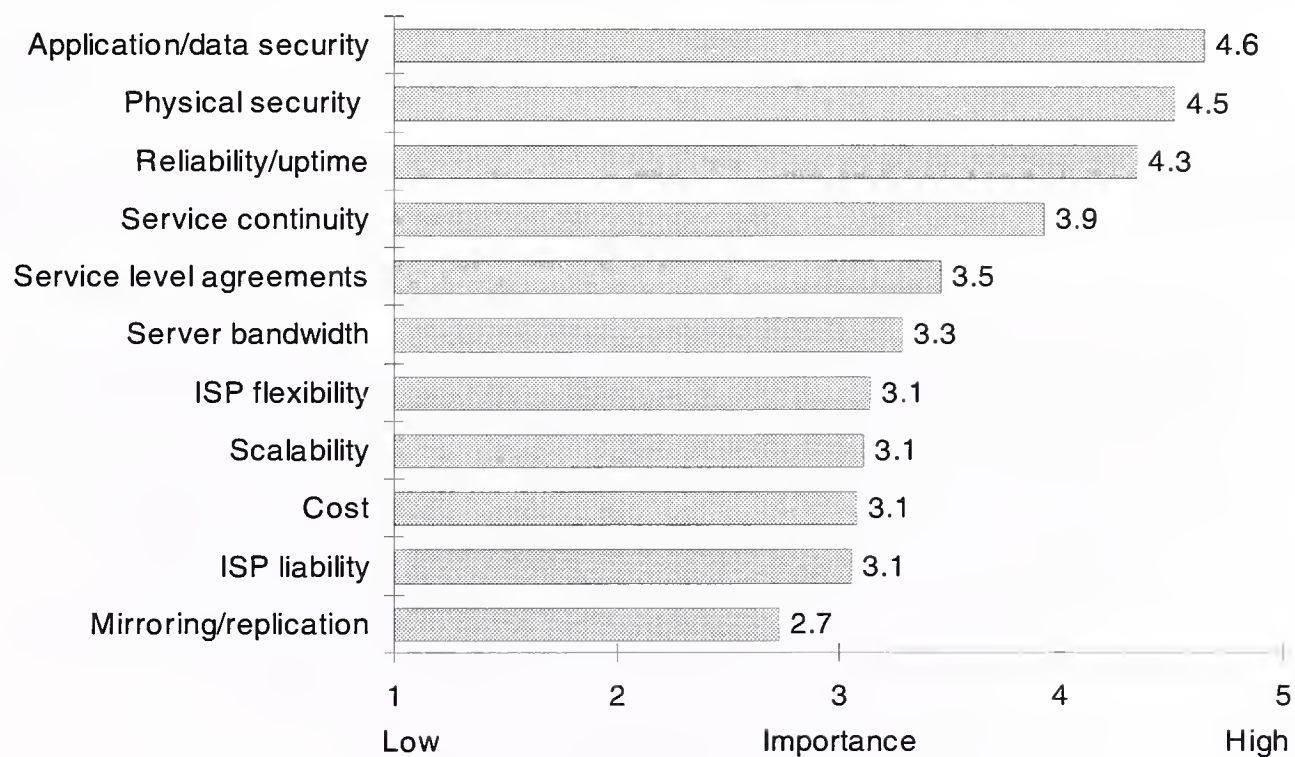
Sample: 69

Source: INPUT

Exhibit VI-7

Current Importance of Web Hosting Characteristics, US

Characteristic	Value
Application/data security	4.8
Physical security	4.7
Reliability/uptime	4.5
Service continuity	4.1
Service level agreements	3.7
Server bandwidth	3.5
Cost	3.3
Scalability	3.3
ISP liability	3.2
ISP flexibility	3.1
Mirroring/replication	2.9

1   2   3   4   5
Low   Importance   High
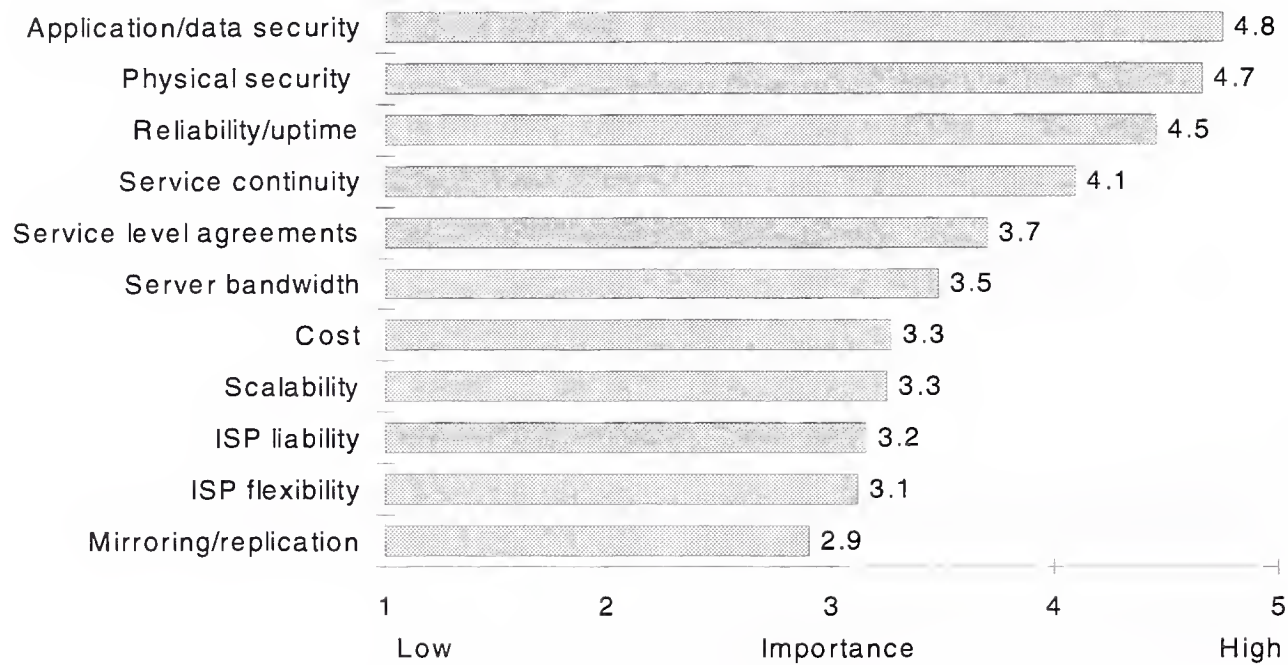
Sample: 33

Source: INPUT

Exhibit VI-8

Current Importance of Web Hosting Characteristics, Europe

Characteristic	Value
Application/data security	4.6
Physical security	4.4
Reliability/uptime	4.3
Service continuity	3.8
Service level agreements	3.3
ISP flexibility	3.2
Server bandwidth	3.1
Scalability	3.0
ISP liability	3.0
Cost	2.9
Mirroring/replication	2.6

1   2   3   4   5
Low   Importance   High
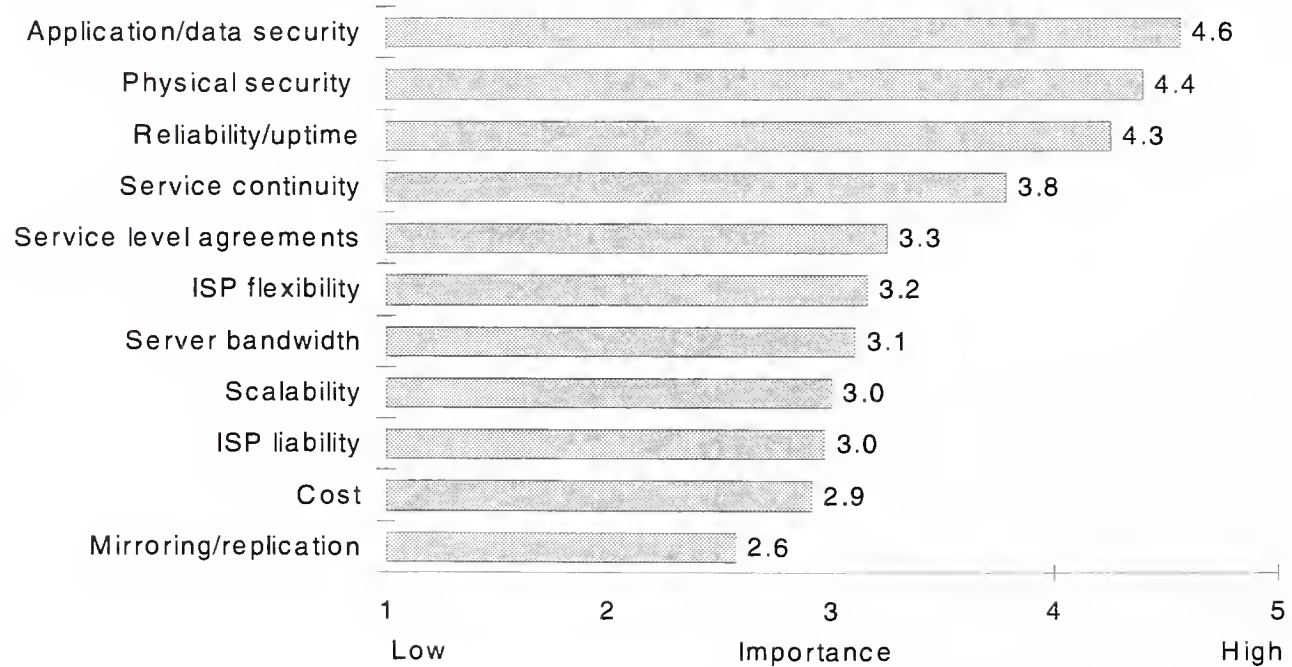
Sample: 36

Source: INPUT

Exhibits VI-9 to VI-11 show how important respondents expect each aspect of their Web hosting service to become over the next two years. Exhibit VI-12 shows the difference in importance for each characteristic. Reliability and security issues are already of very high importance and will remain so.

Over the coming two years and beyond, buyers will place greater emphasis on server bandwidth and server scalability. This reflects the increasingly ambitious and demanding nature of corporate Web sites. Both of these components will increase to critical importance, rated at up to 4.6 out of 5.

With the sharp expected increase in the use of co-located Web servers and the emphasis on capacity issues, users are planning to place greater demands on their sites, and therefore their hosting services, as it becomes increasingly difficult to stand out in the crowded Web market.

Exhibit VI-9

Expected Importance of Web Hosting Characteristics, 2000, Worldwide

Characteristic	Importance
Application/data security	4.8
Reliability/uptime	4.7
Server bandwidth	4.6
Physical security	4.6
Service continuity	4.3
Scalability	4.2
Service level agreements	3.7
ISP liability	3.5
Cost	3.5
ISP flexibility	3.4
Mirroring/replication	3.4

1 Low   2   3 Importance   4   5 High
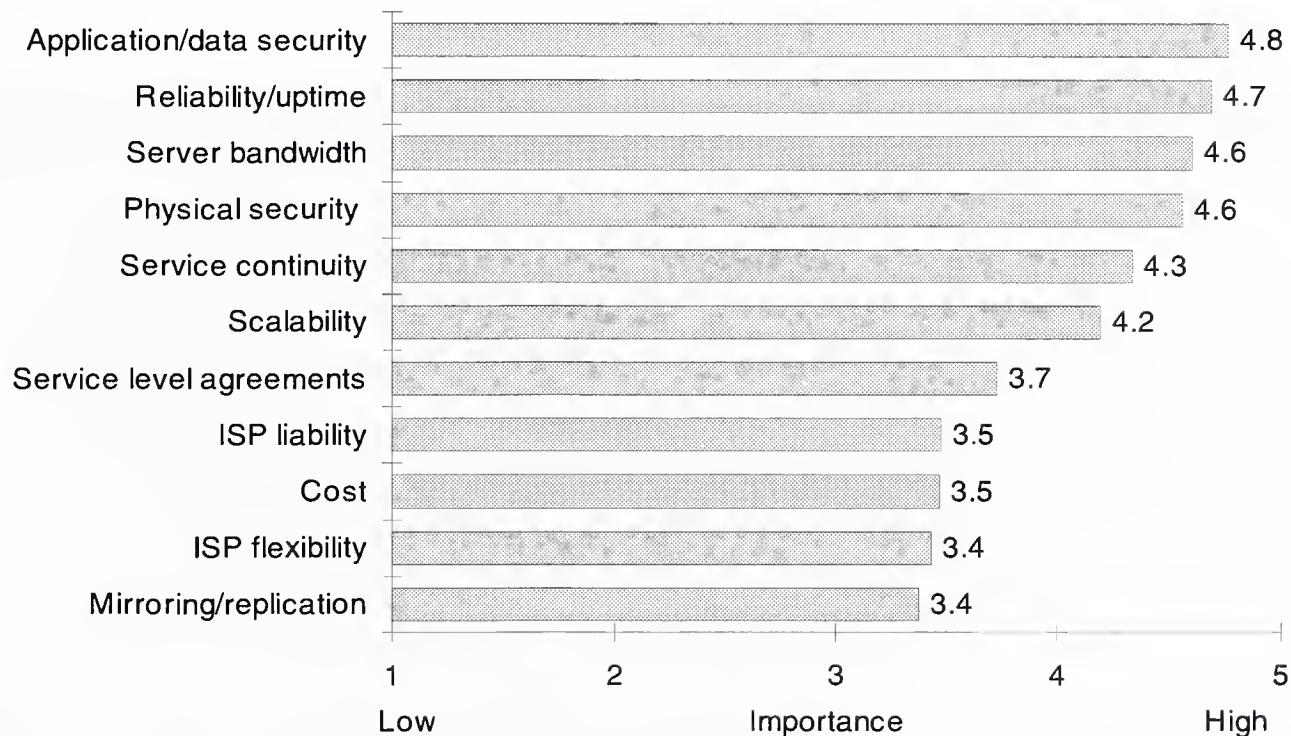
Sample: 90

Source: INPUT

Exhibit VI-10

Expected Importance of Web Hosting Characteristics, 2000, US

Characteristic	Value
Application/data security	4.9
Reliability/uptime	4.7
Physical security	4.6
Server bandwidth	4.6
Scalability	4.5
Service continuity	4.5
Service level agreements	3.9
Cost	3.7
ISP liability	3.6
Mirroring/replication	3.6
ISP flexibility	3.4

1 — Low   2   3 — Importance   4   5 — High
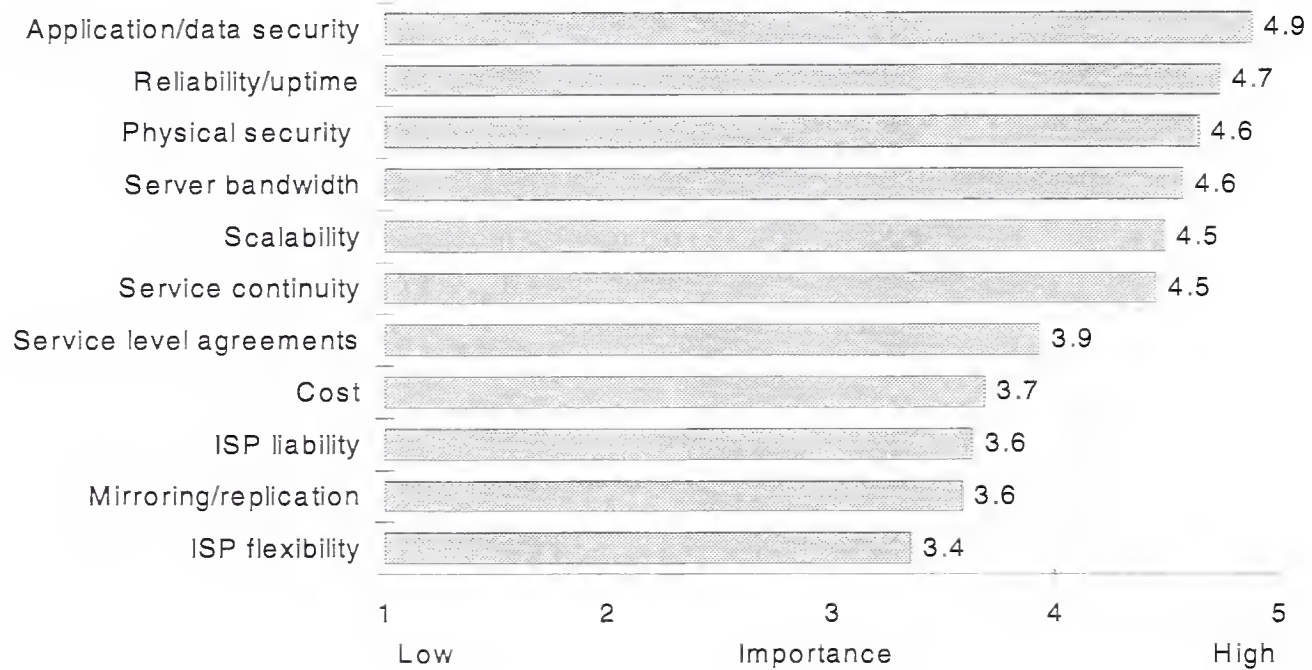
Sample: 42

Source: INPUT

Exhibit VI-11

Expected Importance of Web Hosting Characteristics, 2000, Europe

Characteristic	Value
Application/data security	4.7
Reliability/uptime	4.6
Server bandwidth	4.6
Physical security	4.5
Service continuity	4.2
Scalability	3.9
Service level agreements	3.6
ISP flexibility	3.5
ISP liability	3.3
Cost	3.3
Mirroring/replication	3.2

1 — Low   2   3 — Importance   4   5 — High

Sample: 48

Source: INPUT

EI18W
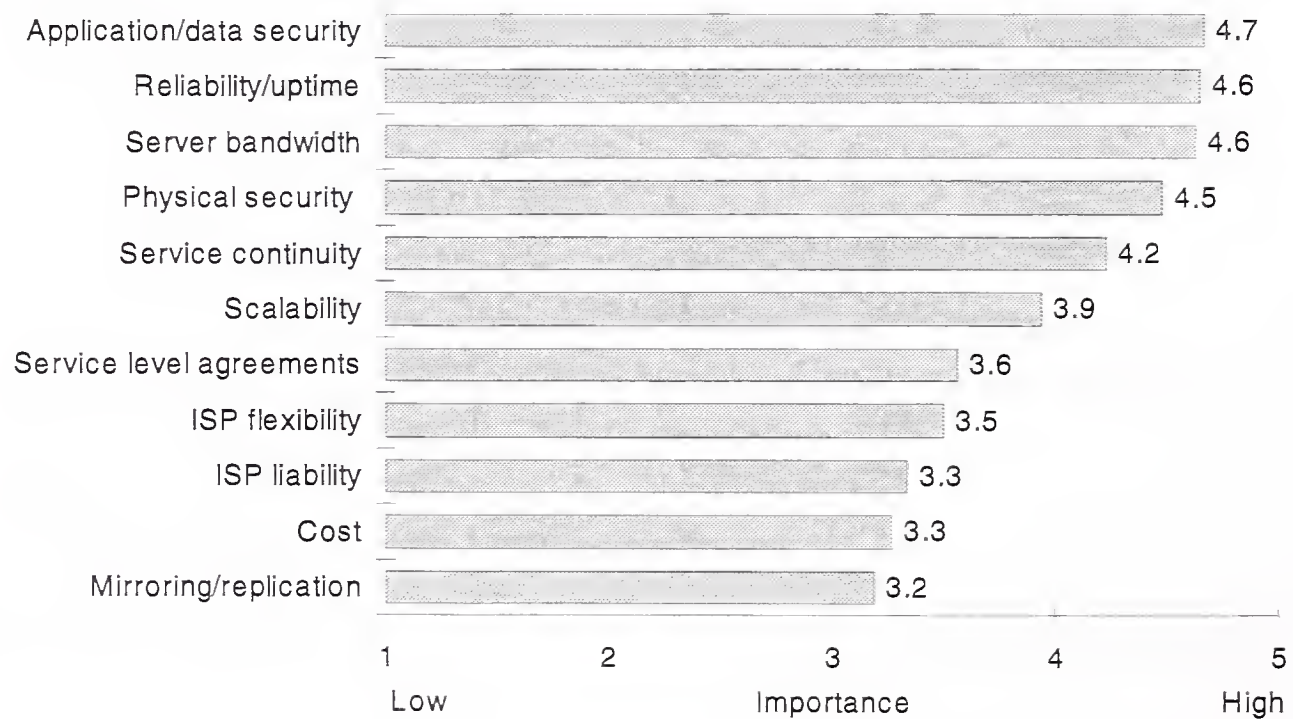
Exhibit VI-12

Expected Change in Importance of Web Hosting Characteristics, Worldwide

Characteristic	Expected Change in Importance
Server bandwidth	1.3
Scalability	1.1
Mirroring/replication	0.6
ISP liability	0.4
Service continuity	0.4
Cost	0.4
Reliability/uptime	0.3
ISP flexibility	0.3
Service level agreements	0.3
Application/data security	0.1
Physical security	0.0
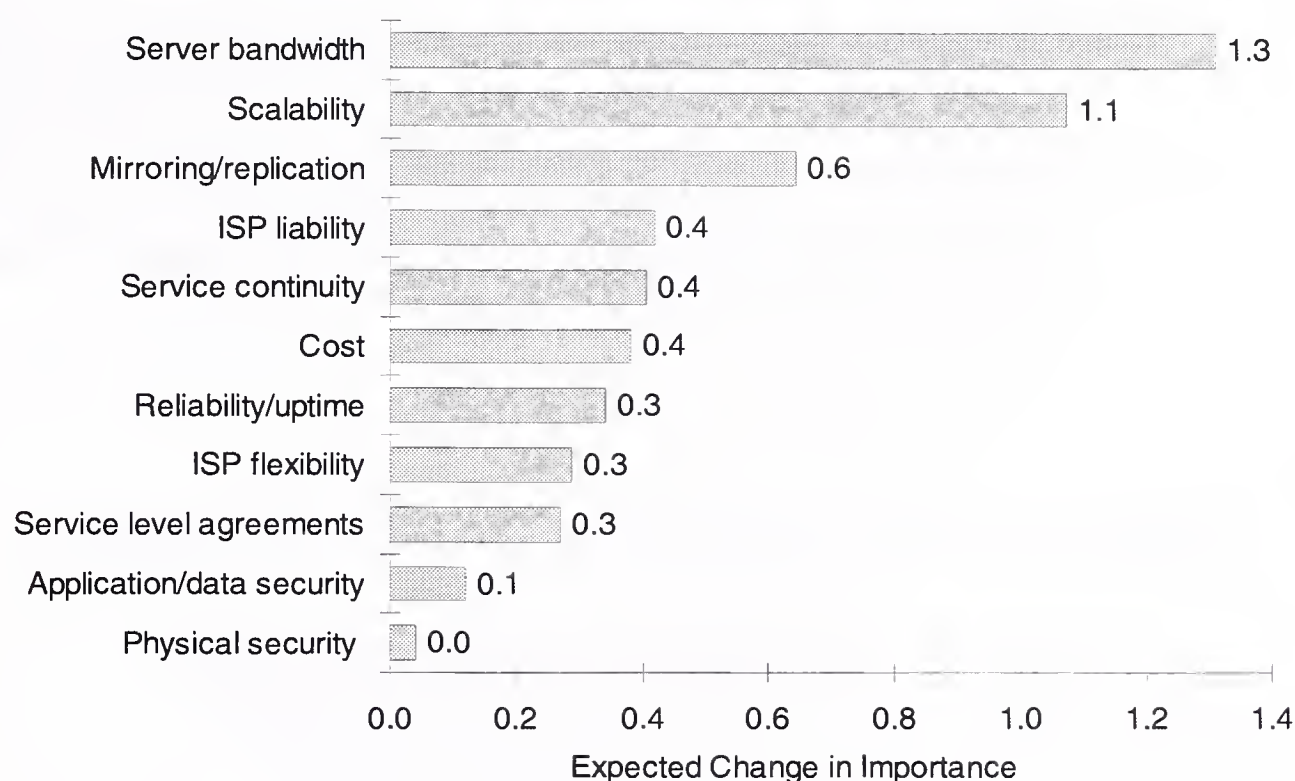
Sample: 90

Source: INPUT

Exhibits VI-13 to VI-15 show the satisfaction ratings given; Exhibit VI-16 shows the difference between the importance currently given to each characteristic and the satisfaction rating received.

Buyers are reasonably satisfied with the aspects of their Web hosting services currently considered most important: security and reliability issues. However, they are not satisfied with the characteristics expected to increase considerably in importance: server bandwidth and scalability. Users expect to see improvements in these areas take effect rapidly—their importance will increase to critical proportions by 2000 as measured above, and that increase is taking place now.

The organizations interviewed are not receiving adequate capacity for either their current or future needs. This may be due to lack of capacity at the ISP, or inadequate service coverage by the customer. ISPs should consider:

- Taking a proactive approach to managing customers' server capacity (network and system). Where applicable, consult with customers regularly to determine short- and long-term requirements; monitor

usage and make recommendations on the results; proactively make users aware on an individual basis of service upgrade options.

- De-emphasizing possible undue focus on issues of lesser importance (according to respondents, cost and content mirroring/replication although no aspect is unimportant) and concentrate on bringing server capacity up to requirements, both to answer current dissatisfaction and to meet the future requirements of resource-heavy sites serving ever-increasing numbers of users.

Exhibit VI-13

Satisfaction With Web Hosting Characteristics, Worldwide

Characteristic	Satisfaction
Reliability/uptime	4.2
Application/data security	3.9
Service continuity	3.7
Physical security	3.7
Service level agreements	3.5
Cost	3.3
Scalability	3.1
Server bandwidth	3.1
ISP flexibility	3.0
Mirroring/replication	3.0
ISP liability	2.7

Scale: 1 (Low) — 3 (Satisfaction) — 5 (High)
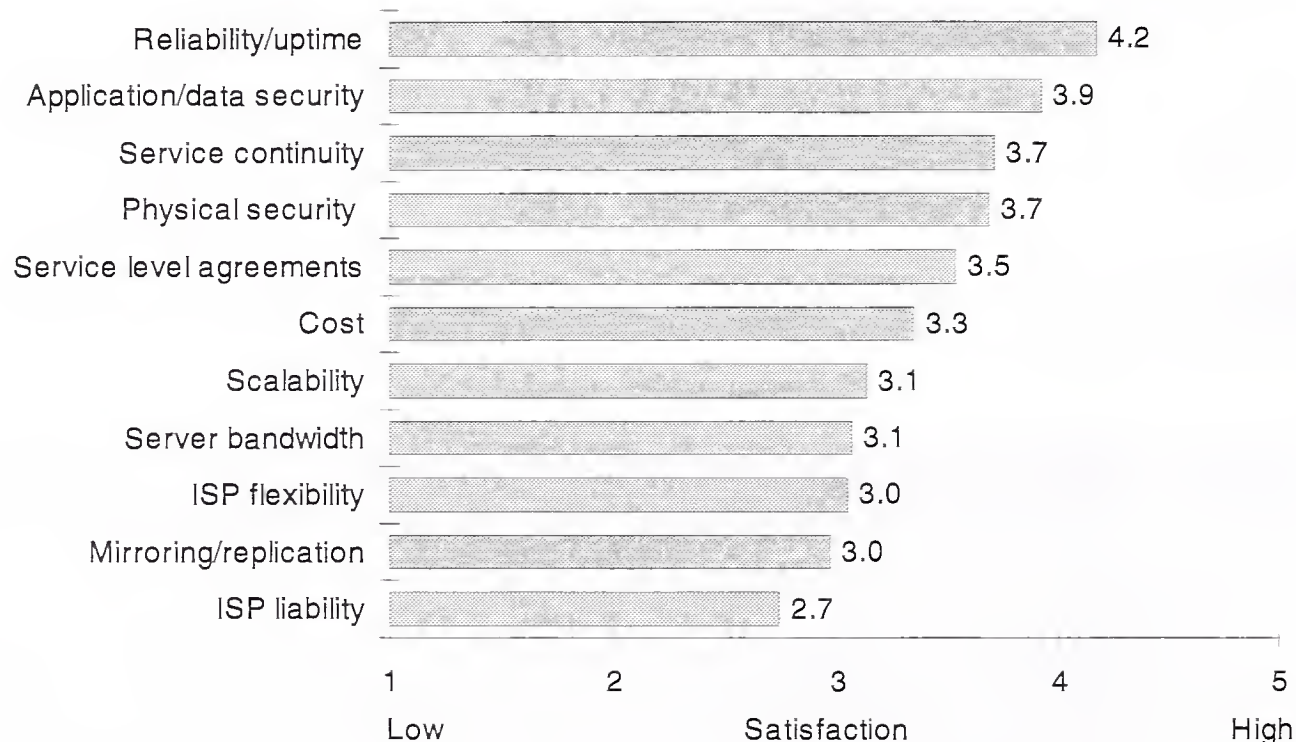
Sample: 64

Source: INPUT

Exhibit VI-14

Satisfaction With Web Hosting Characteristics, US

Characteristic	Rating
Reliability/uptime	4.3
Application/data security	3.9
Service continuity	3.8
Physical security	3.8
Service level agreements	3.6
Cost	3.4
Scalability	3.2
Server bandwidth	3.1
Mirroring/replication	3.1
ISP flexibility	3.0
ISP liability	2.6

1 Low   2   3 Satisfaction   4   5 High
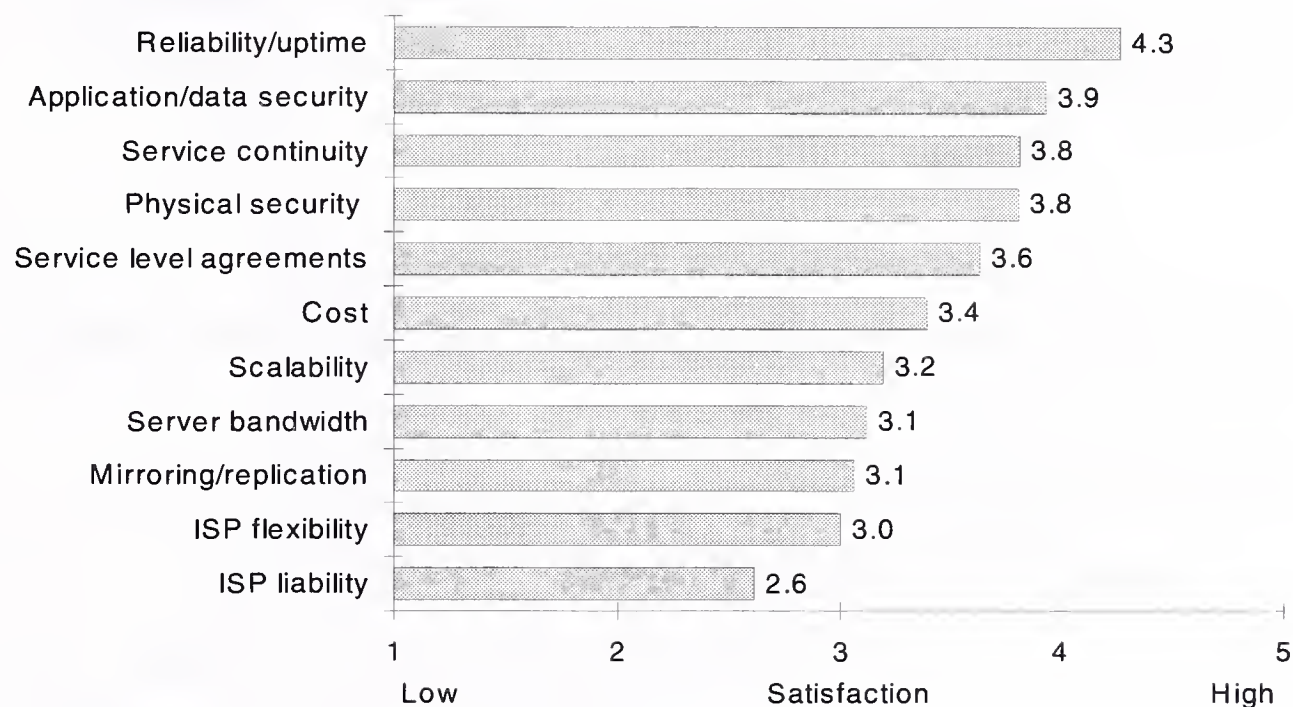
Sample: 33

Source: INPUT

Exhibit VI-15

Satisfaction With Web Hosting Characteristics, Europe

Characteristic	Rating
Reliability/uptime	4.1
Application/data security	3.9
Service continuity	3.6
Physical security	3.5
Service level agreements	3.4
Cost	3.3
ISP flexibility	3.1
Scalability	3.1
Server bandwidth	3.0
ISP liability	2.9
Mirroring/replication	2.9

1 Low   2   3 Satisfaction   4   5 High
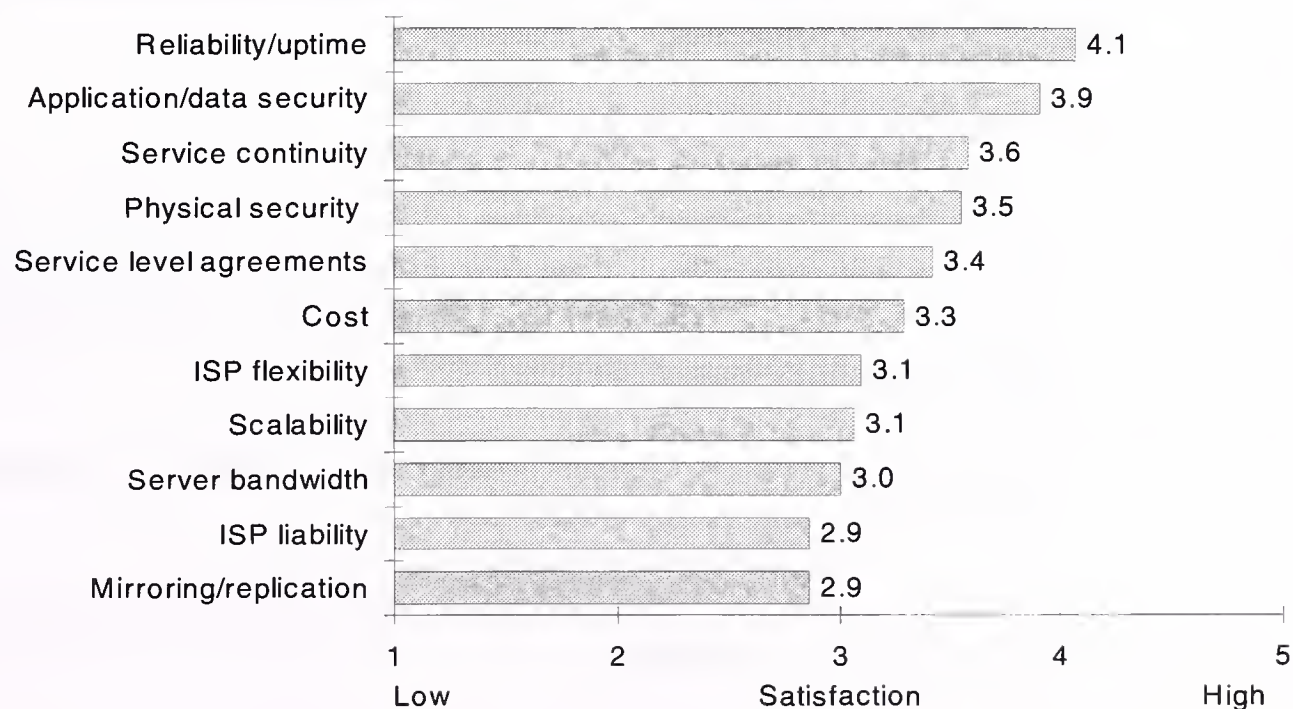
Sample: 31

Source: INPUT

Exhibit VI-16

Difference Between Importance of and Satisfaction With Web Hosting Characteristics, Worldwide
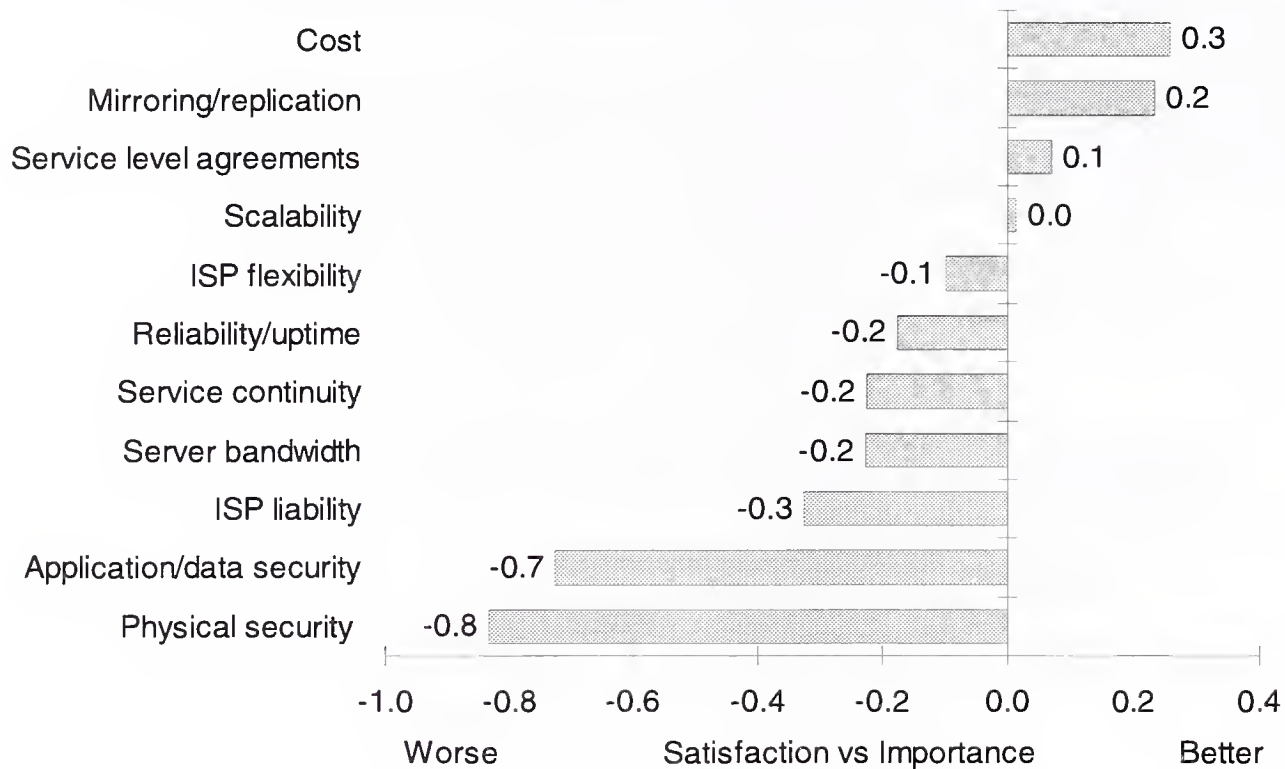
Sample: 69

Source: INPUT

Respondents were asked how their Web hosting service could be improved. Many stated a need for increased bandwidth available to the server (discussed above).

Other comments, reflected above, were:

- Management—four respondents felt that their ISP did not manage the server or its connection to required standards. One respondent wanted the ISP to view the Web service as a business function instead of as a pure technology-based service.

- Security—one respondent expressed concern over the quality of application security provided.

- Service levels—one respondent stated that a lack of a solid service guarantee was a problem.

C
Purchasing Criteria

As shown in Exhibit VI-17, buyers seek suppliers that can ensure a robust, secure service above all other issues. The criteria used for purchasing decisions are similar to the characteristics of hosting services considered most important.

Exhibit VI-17

Criteria Used for Purchasing Web Hosting Services, Worldwide
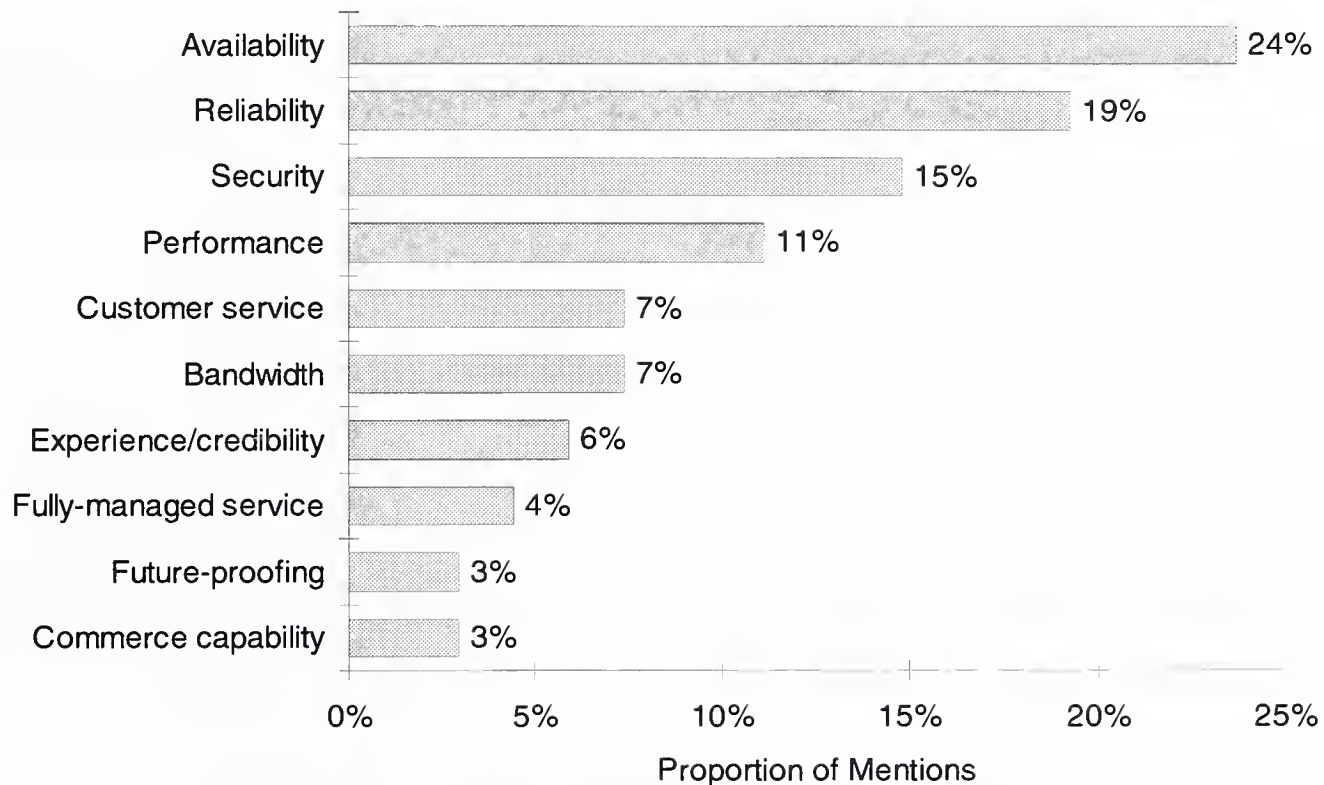
Sample: 135

Source: INPUT

Other criteria, each mentioned by between one and three respondents, were:

- Ability to run bespoke applications

- Adequate control over Web site

- Backup facility

- Breadth of services

- Capacity/scalability

- Combination of technical skill and business understanding

- Consultancy service

- Adherence to industry standards

- Integration with EDI services

- Liability

- Responsiveness to changing requirements

- Secure transactions

- Service level agreements

<div style="text-align:center">

VII

</div>

Application Hosting Usage and Plans

A
Server Ownership

Application hosting services cover application servers, database servers, and private Intranet servers, with some overlap between the categories (as discussed elsewhere). For example, Lotus Notes/Domino provides functionality in all three areas.

Exhibits VII-1 to VII-3 show the expected increase in the use of shared, dedicated, and co-located servers. As a proportion of all respondents, usage of all options will increase. As a proportion of those respondents who are currently using or plan to use a hosting service, however, use of shared servers is expected to drop slightly.

Growth is most pronounced in Europe; respondents expect to achieve similar usage levels as US respondents by 2000, but starting from a lower base.

Exhibit VII-1

Current and Expected Hosted Application Server Ownership, Worldwide

Proportion of Respondents

1998	2000
63%	31%
15%	29%
14%	26%
8%	13%

Legend:
- ☐ No service
- ☐ Co-located
- ▦ Dedicated
- ▨ Shared
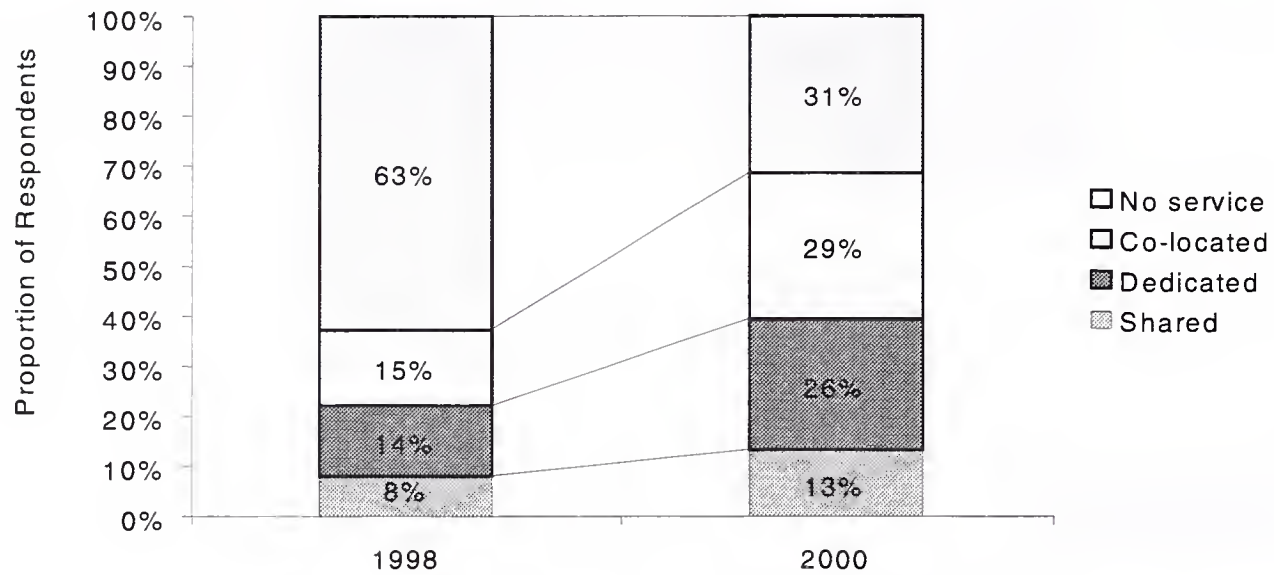
Sample: 150

Source: INPUT

Exhibit VII-2

Current and Expected Hosted Application Server Ownership, US

Proportion of Respondents

1998	2000
56%	28%
19%	28%
17%	28%
8%	16%

Legend:
- ☐ No service
- ☐ Co-located
- ▦ Dedicated
- ▨ Shared

Sample: 75

Source: INPUT

EI18W
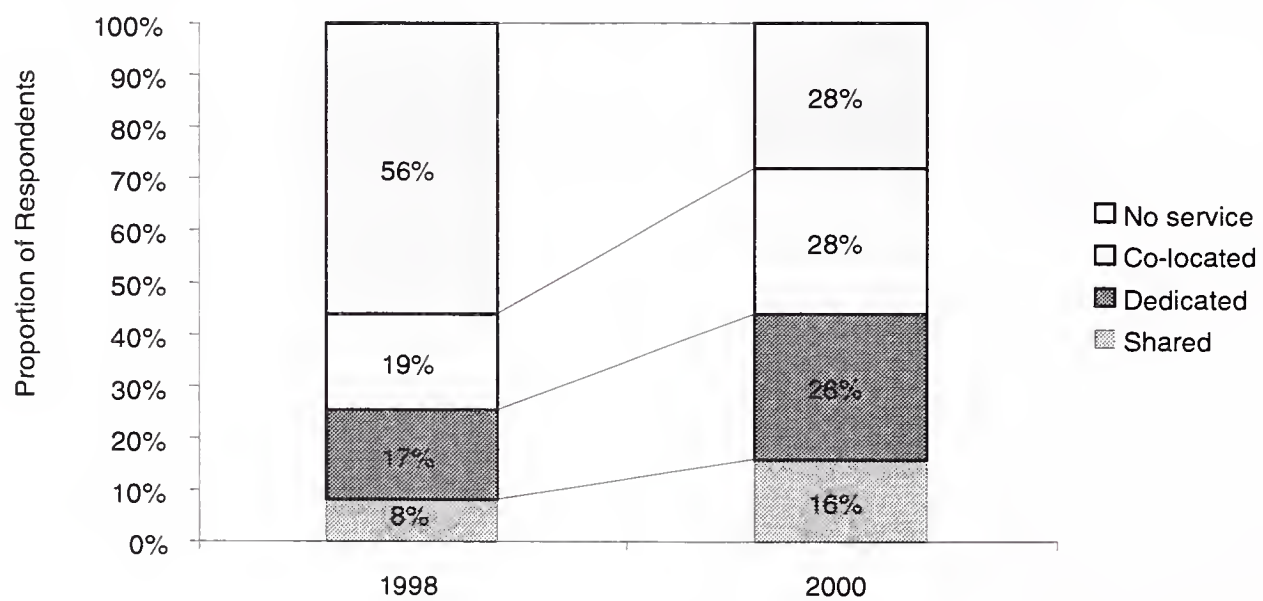
Exhibit VII-3
Current and Expected Hosted Application Server Ownership, Europe
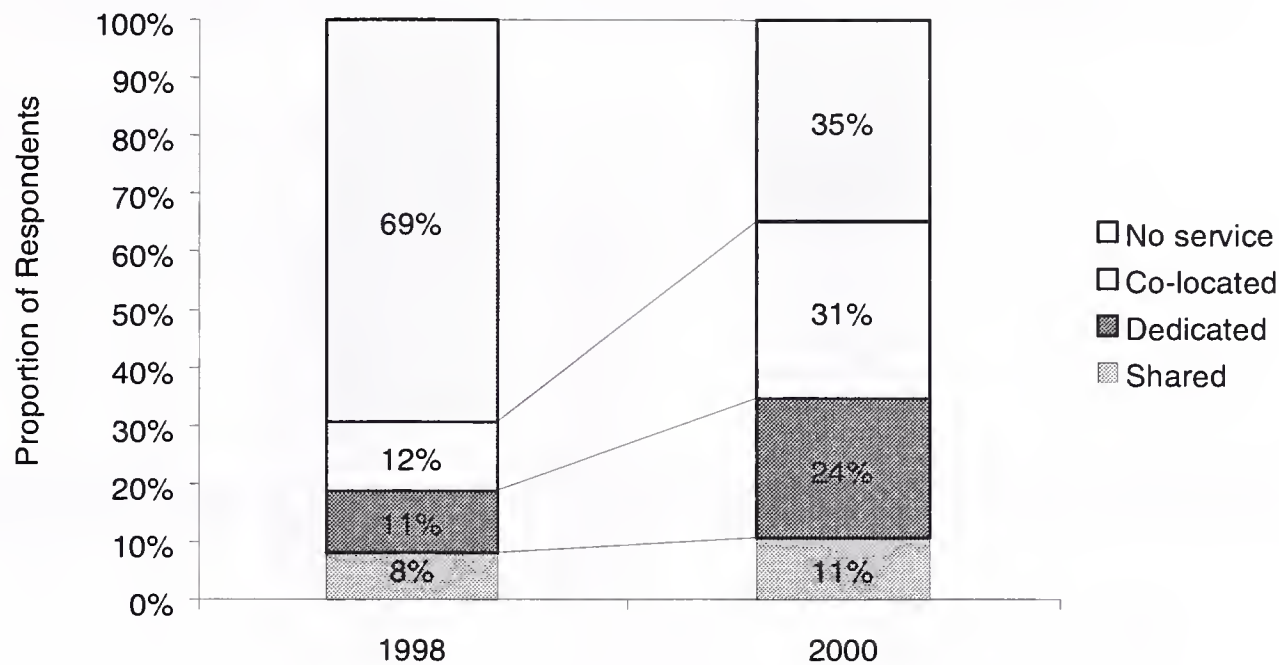
Sample: 75

Source: INPUT

B

Management Responsibility

As with Web hosting services, ISPs should be ready to accept a greater degree of management responsibility. Currently, as Exhibits VII-4 to VII-6 show, system, application, and content management is most commonly performed by users themselves, accessing the server remotely. ISPs' most active roles are in system management of hosted servers.

Exhibits VII-7 to VII-9 show that buyers want ISPs to take over more of the management role, particularly system management. This is seen as a benefit of a hosting service that currently is not being delivered according to customers' preferences. Exhibit VII-10 shows the difference between current and preferred management roles, and highlights these preferences.

Buyers expect a higher level of mangement from ISPs to support these and other applications currently being hosted than they currently receive. The market for fully-managed application hosting solutions is beginning to take shape; early applications suitable for hosting remotely included

groupware and shared workspaces. Hosting services that provide access to high-end enterprise applications have been, and still are, limited by the ability of underlying enterprise applications to operate natively in the Internet environment.

Vendors such as SAP and Oracle are progressing rapidly with Internet- and Intranet-enabling their enterprise solutions, and several ISPs during 1997 and 1998 have announced services, or plans to introduce services, based on supplying remote access to these and similar applications.

Exhibit VII-4

Hosted Application Server Management Responsibilities, Worldwide
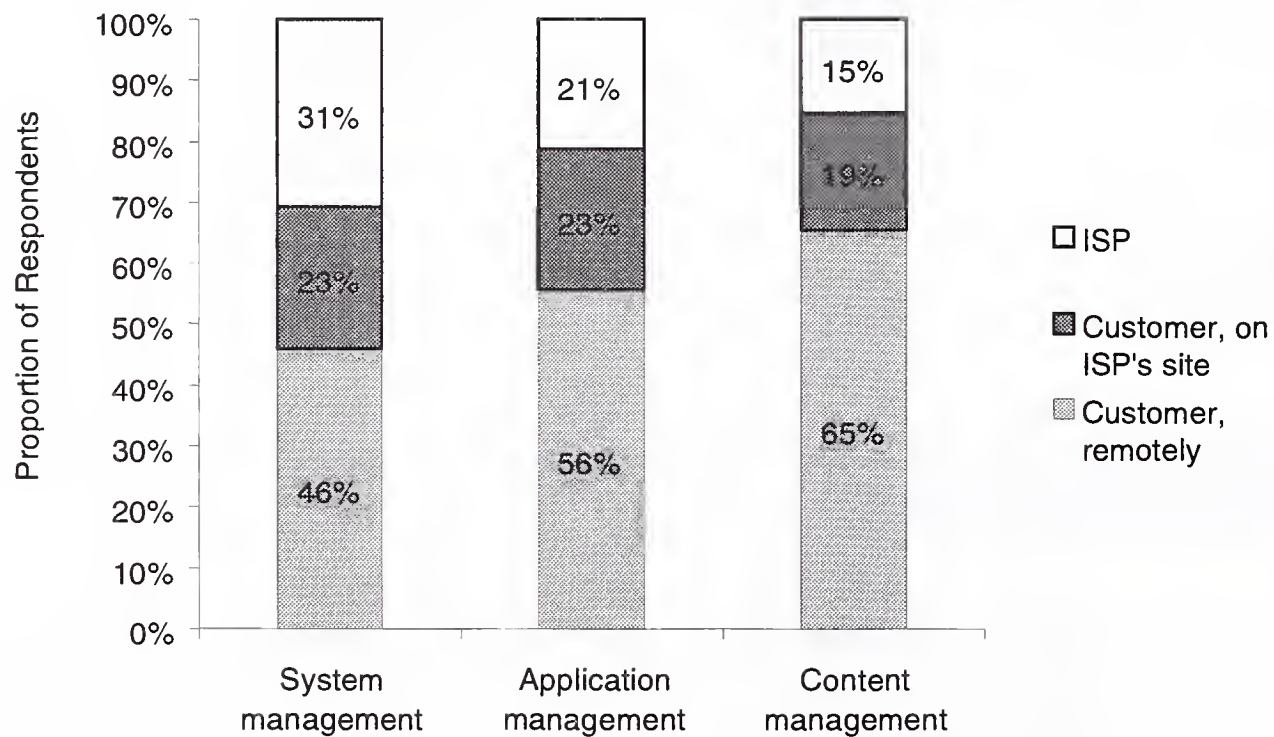
Sample: 52

Source: INPUT

Exhibit VII-5

Hosted Application Server Management Responsibilities, US

Proportion of Respondents

	System management	Application management	Content management
ISP	28%	19%	9%
Customer, on ISP's site	19%	19%	16%
Customer, remotely	53%	63%	75%
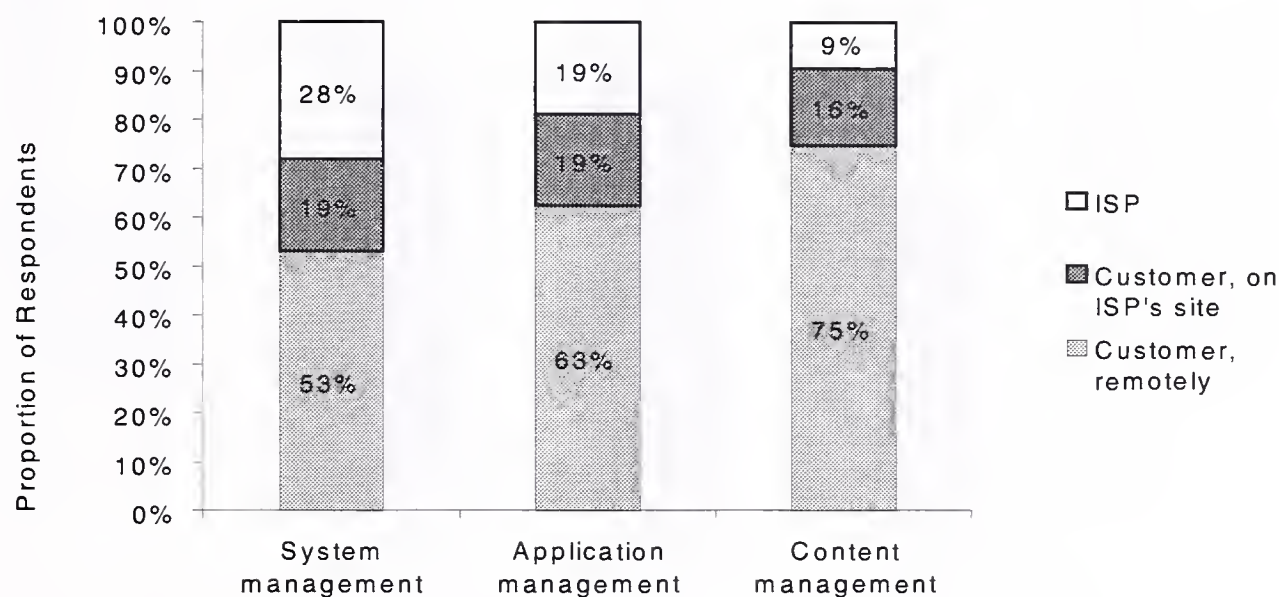
Sample: 32

Source: INPUT

Exhibit VII-6

Hosted Application Server Management Responsibilities, Europe

Proportion of Respondents

	System management	Application management	Content management
ISP	35%	25%	25%
Customer, on ISP's site	30%	30%	25%
Customer, remotely	35%	45%	50%
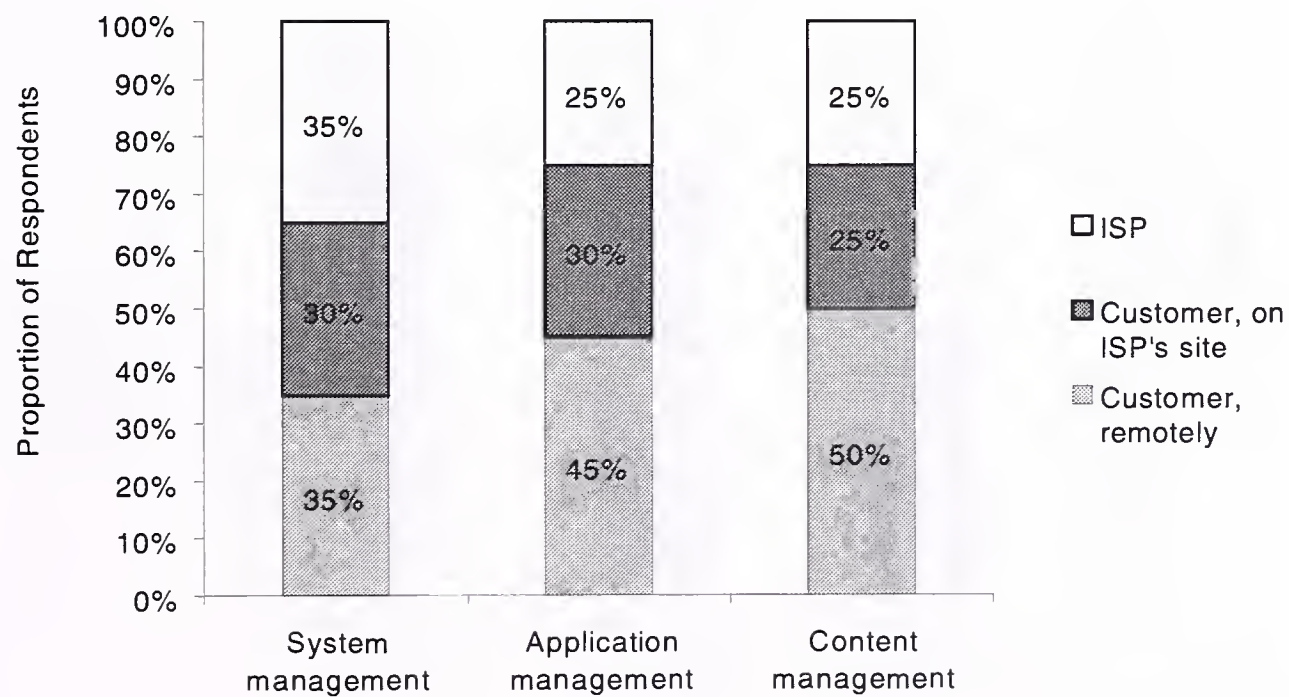
Sample: 20

Source: INPUT

Exhibit VII-7

Preferred Application Hosting Management Responsibilities, Worldwide
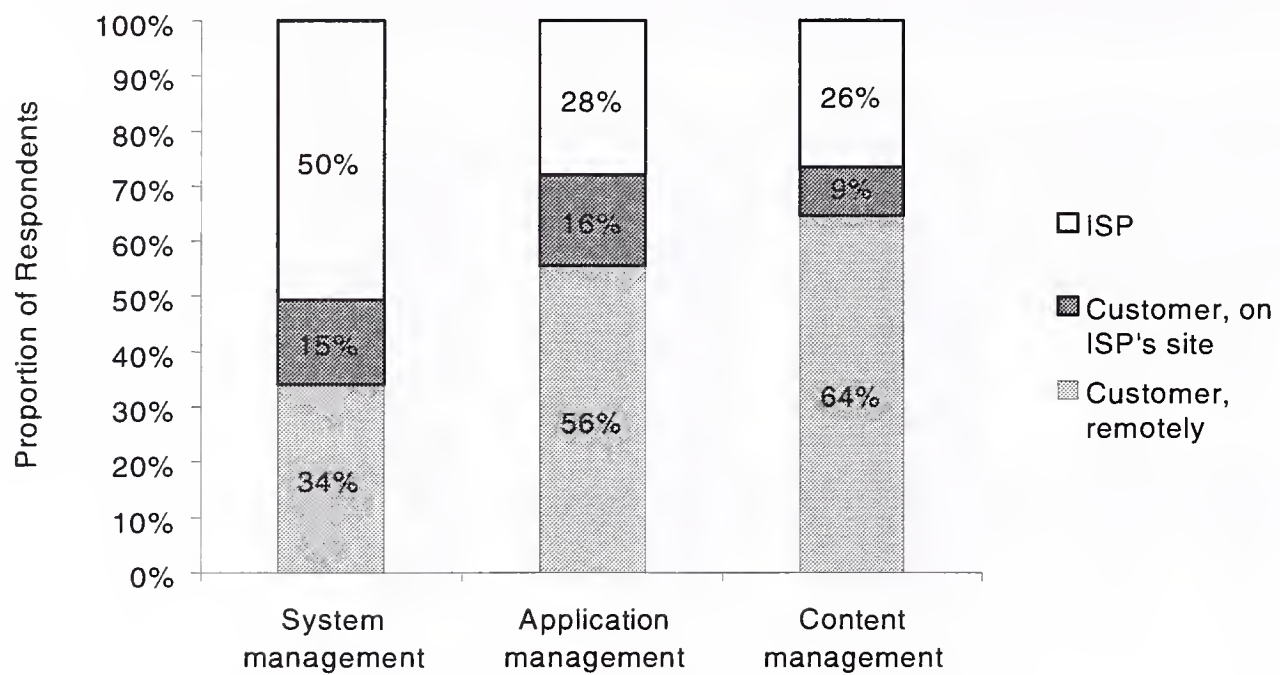
Sample: 80

Exhibit VII-8

Preferred Application Hosting Management Responsibilities, US
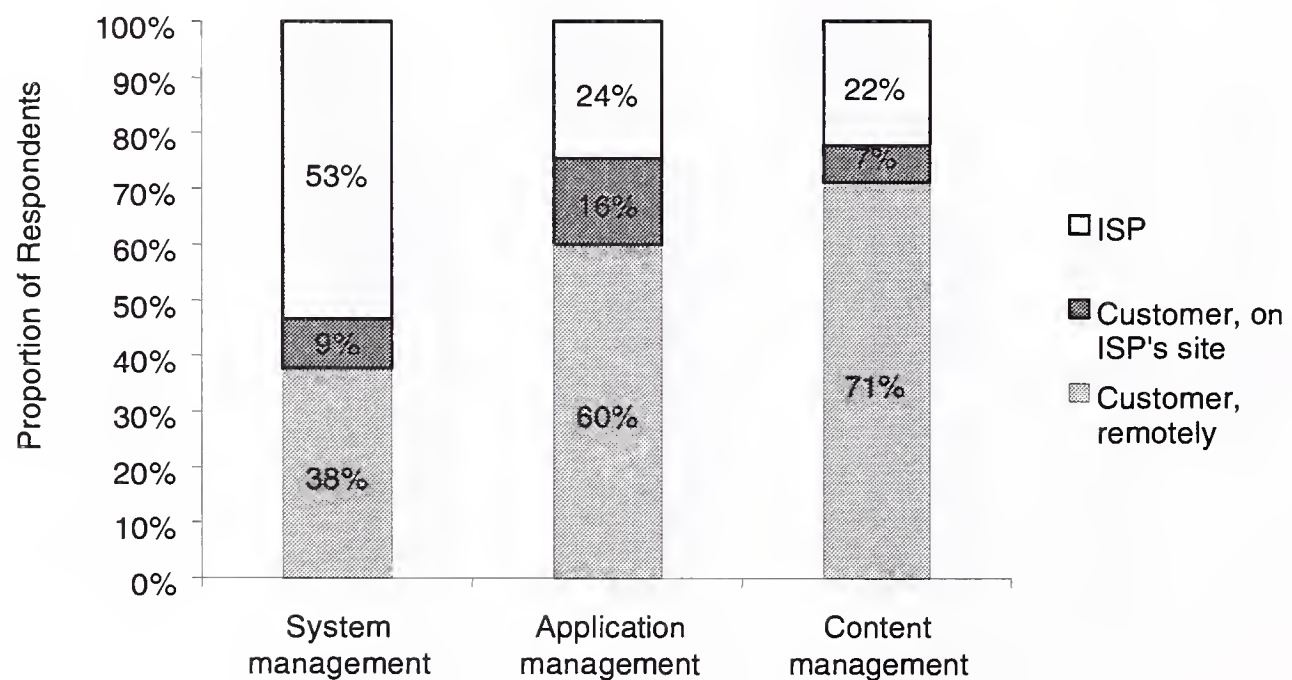
Sample: 45

Exhibit VII-9

Preferred Application Hosting Management Responsibilities, Europe

Proportion of Respondents

	System management	Application management	Content management
ISP	46%	32%	31%
Customer, on ISP's site	23%	18%	11%
Customer, remotely	29%	50%	54%
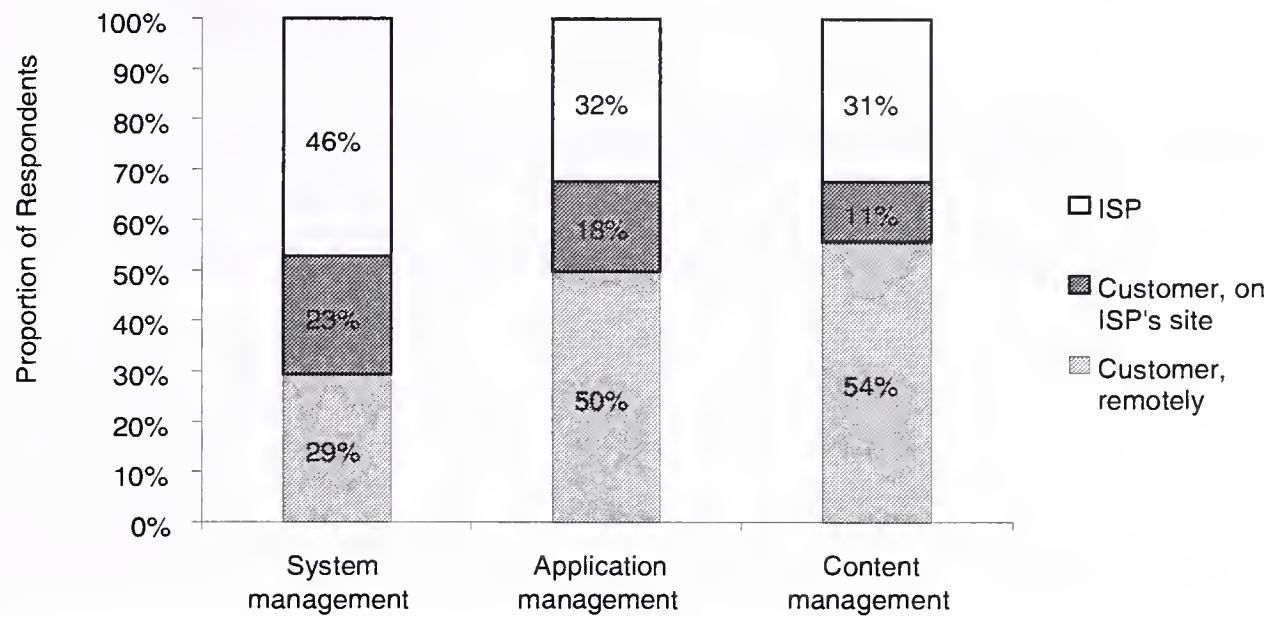
Sample: 35

Source: INPUT

Exhibit VII-10

Difference Between Current and Preferred Application Hosting Management Responsibilities, Worldwide

Current vs Preferred Management Responsibility

ISP Opportunity

	System management	Application management	Content management
Customer, remotely	-12%	0%	-2%
Customer, on ISP's site	-8%	-7%	-10%
ISP	19%	7%	11%
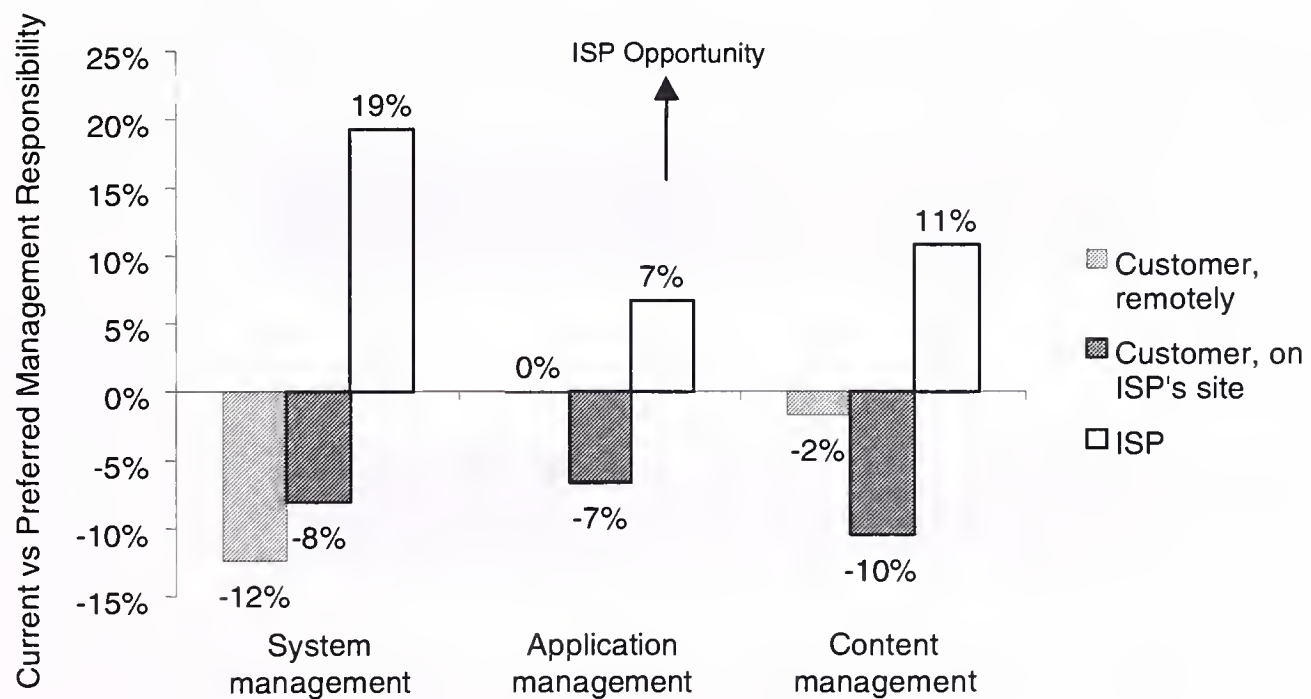
Sample: 80

Source: INPUT

C

ISP Consistency

Provision of an Internet access service does not guarantee an ISP additional service business from a corporate customer. Exhibit VII-11 shows that many organizations seek alternative suppliers of Web hosting services, particularly in the US, where buyers use their existing access provider and an alternative hosting provider in equal measure.

For the same reasons given for Web hosting—high customer turnover due to the ease with which users can change suppliers—ISPs cannot rely on buyers operating a one-stop-shop policy. Integrated services will not necessarily capture business that otherwise would be lost to competing suppliers. ISPs must take a procactive sales approach to selling additional services to existing customers of Internet access.

No reasons were given for using a different ISP for application hosting than for Internet access.

Exhibit VII-11

Use of Same ISP for Internet Access and Application Hosting
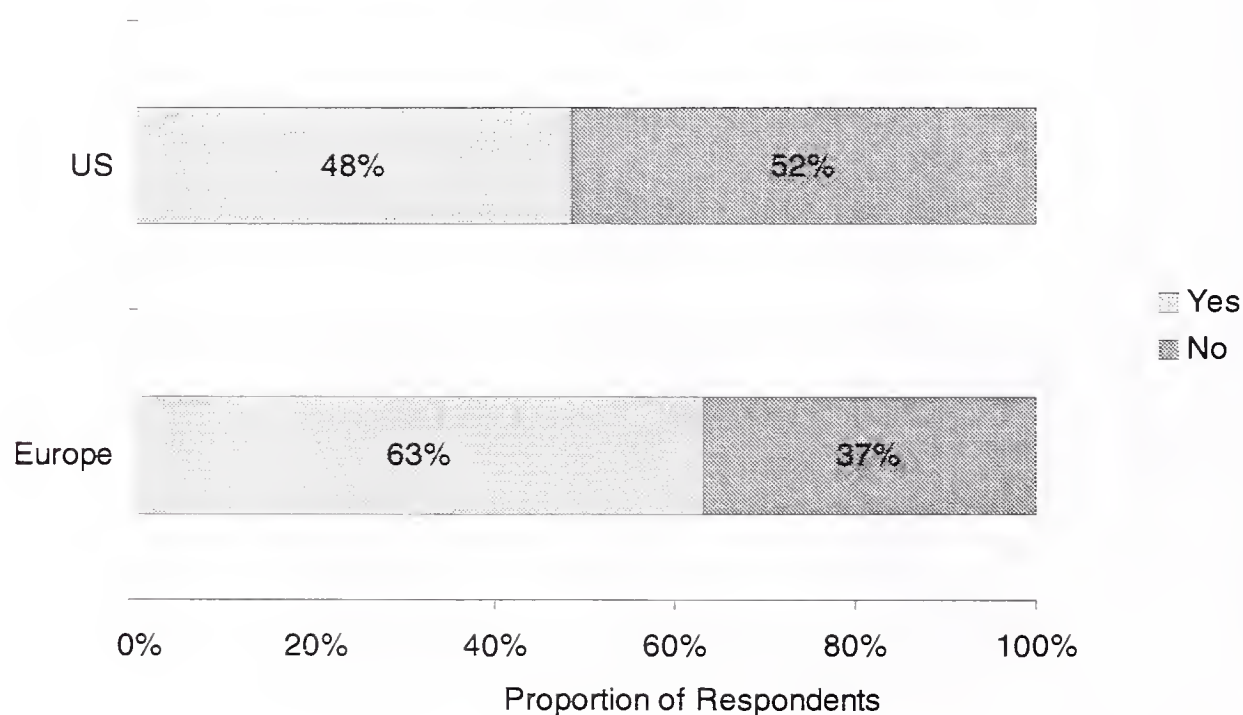
US — 48% — 52%

Europe — 63% — 37%

Legend: Yes / No

0%   20%   40%   60%   80%   100%

Proportion of Respondents

Sample: 80

Source: INPUT

VIII

Application Hosting Benefits, Satisfaction, and Criteria

A
Benefits

Similar to the benefits rated for Web hosting services, increasing the robustness of an application through the enhanced security, reliability, and problem resolution of a hosted service, as opposed to in-house provision, is seen as a great benefit by buyers.

Even greater than this, however, is the potential to distribute access to corporate applications across offices and branches. By using an ISP as a hub, with its wide geographic reach, application hosting services can provide an effective solution to application distribution and deployment. The high levels of realization achieved by users show that this benefit is real and attainable.

Exhibit VIII-1

Application Hosting Benefits, Worldwide
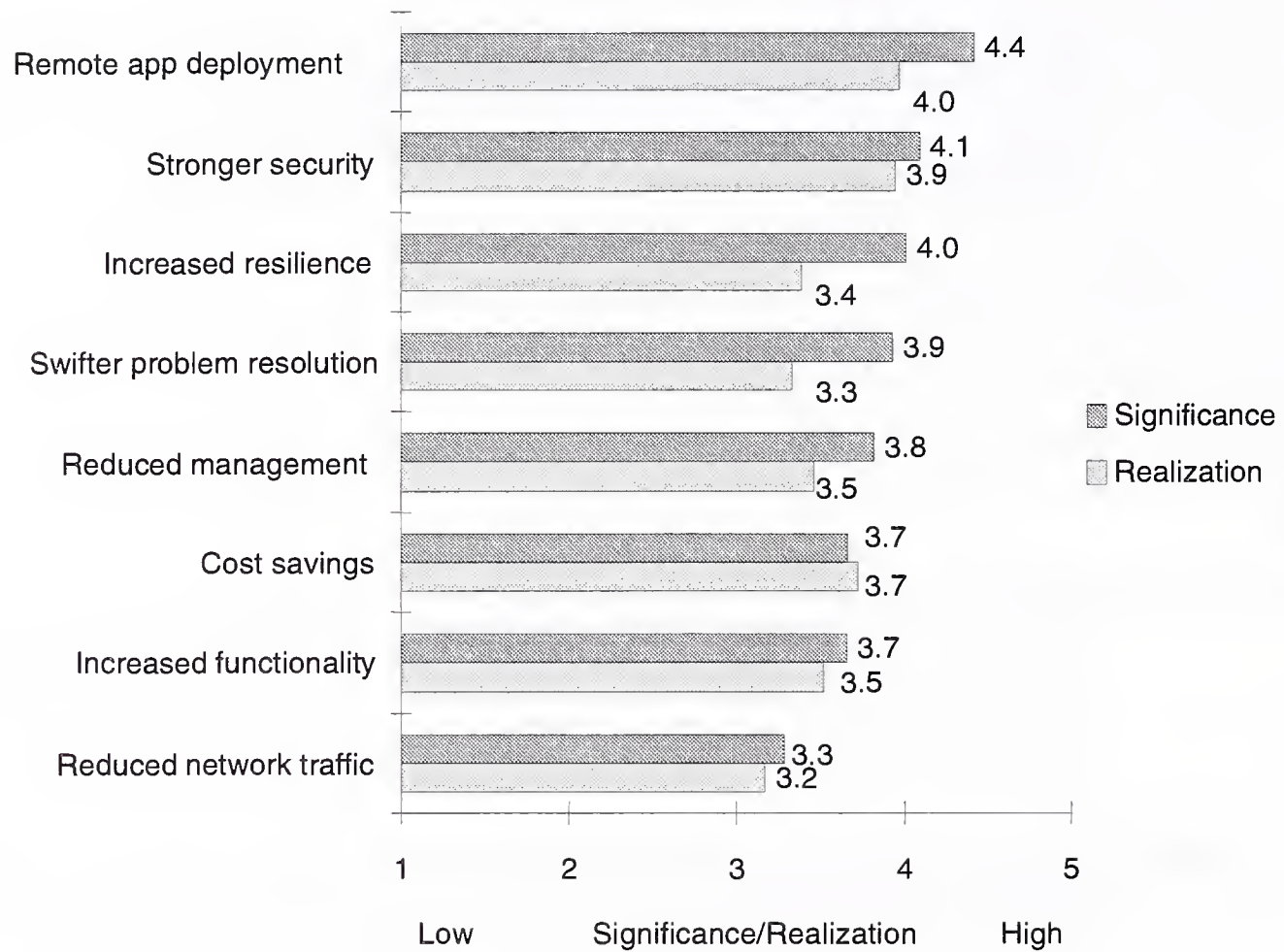
Sample: 98

Exhibit VIII-2

Application Hosting Benefits, US

Low   Significance/Realization   High
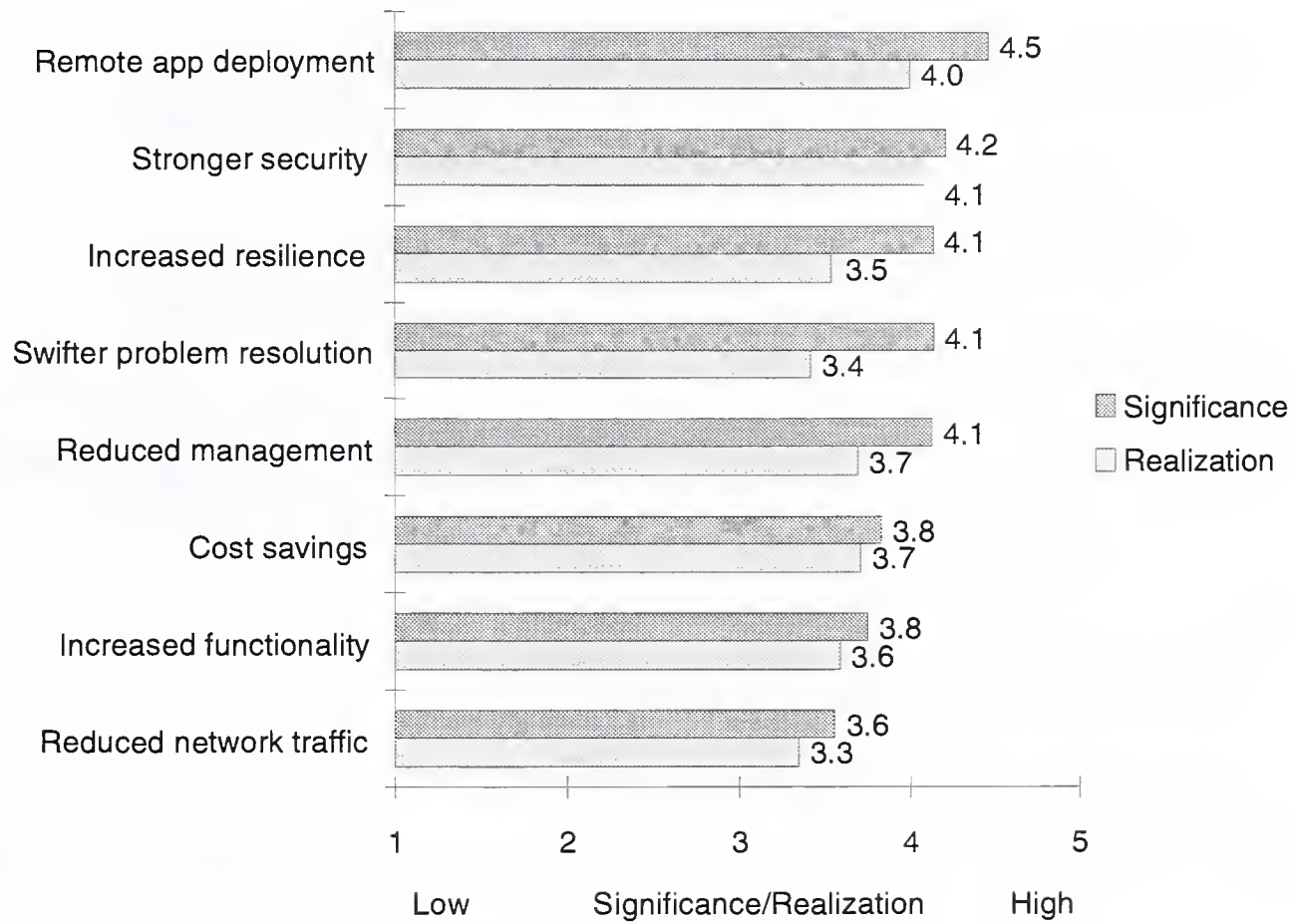
Sample: 53

Source: INPUT

Exhibit VIII-3

Application Hosting Benefits, Europe

Sample: 45

B
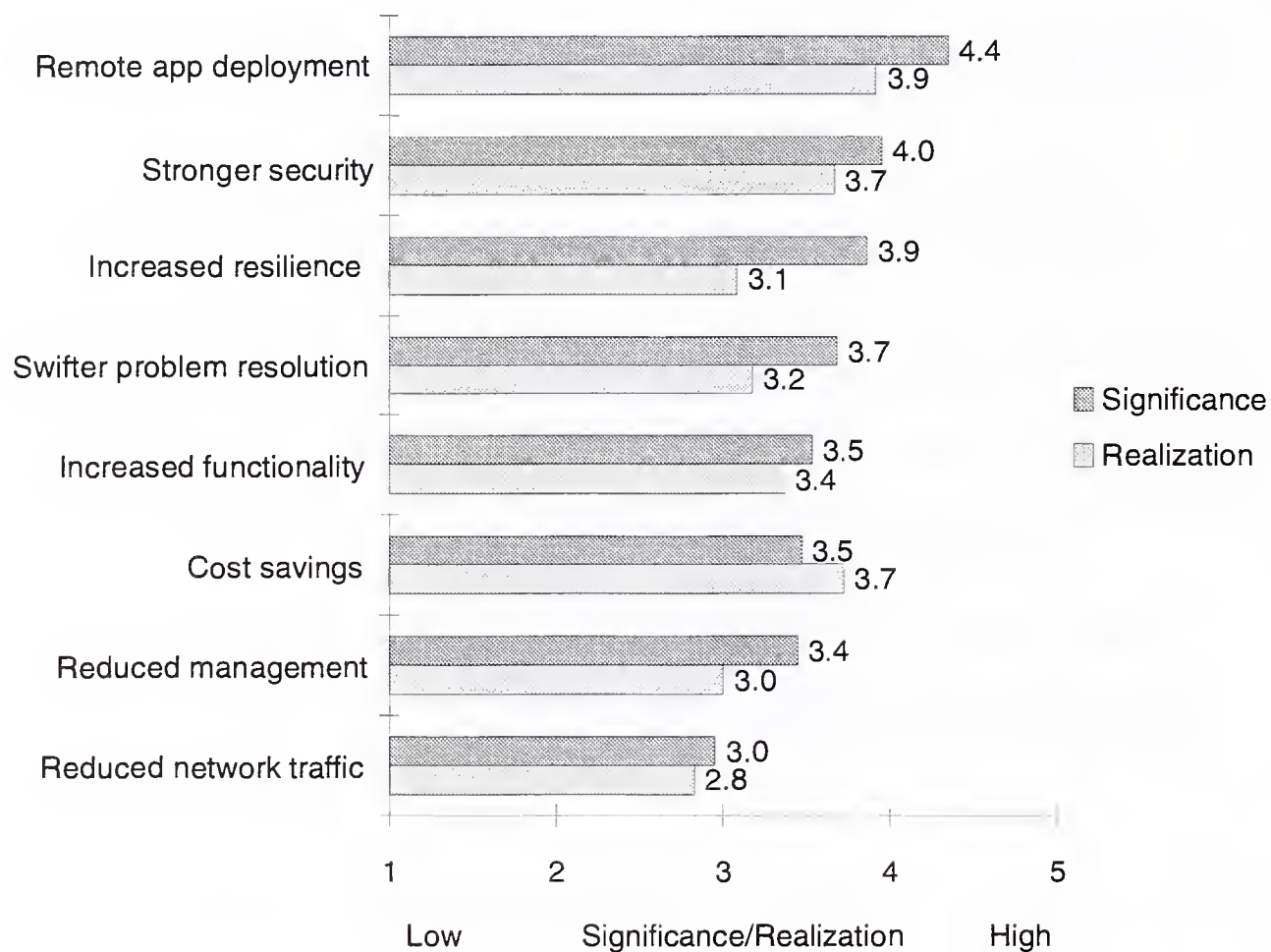
Satisfaction

Exhibits VIII-4 to VIII-7 show the overall satisfaction ratings given by respondents to their application hosting service by region and by industry sector. Unlike Internet access, buyers are only moderately satisfied with their services, averaging 3.6 overall. It should be noted that despite the relatively high apparent rating given by respondents in the retail sector, the sample of retail industry respondents who gave a rating was very small, at nine organizations.

Exhibit VIII-4

Overall Satisfaction With Application Hosting Services, by Region

Low   Satisfaction   High

Average: 3.6
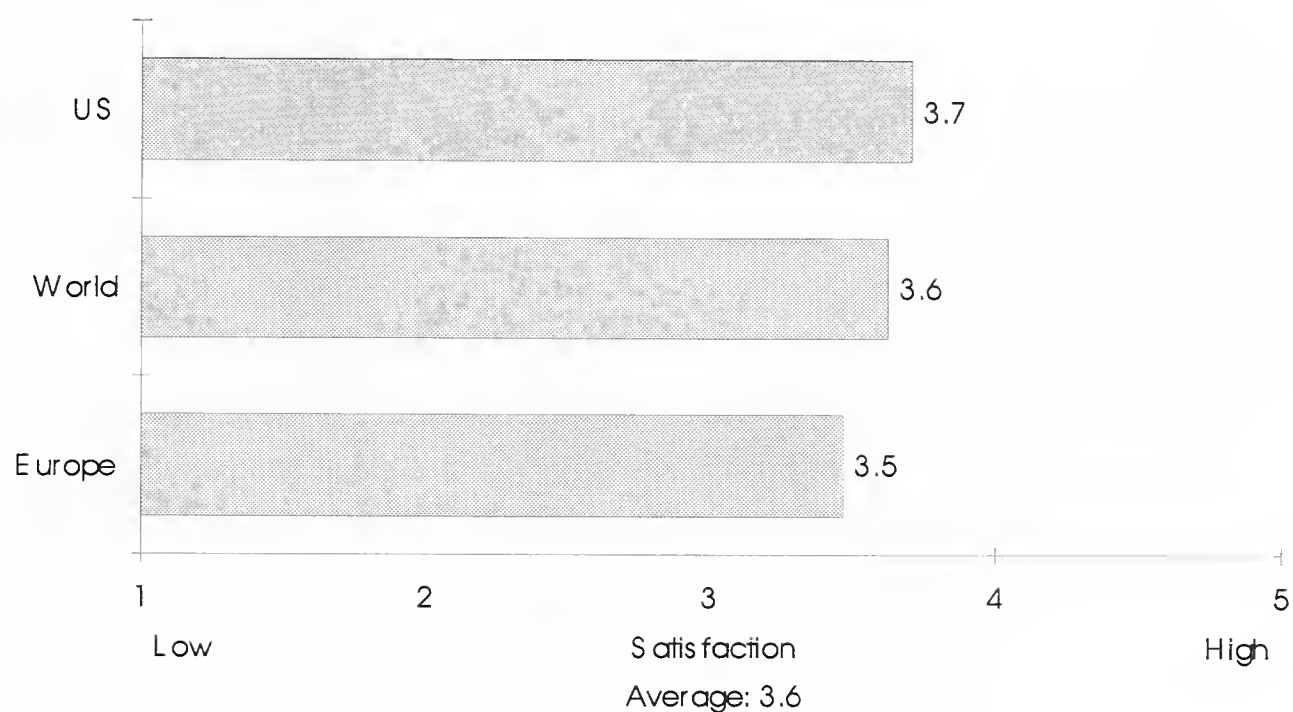
Sample: 48

Source: INPUT

Exhibit VIII-5

Overall Satisfaction With Application Hosting Services, by Industry

Low   Satisfaction   High

Average: 3.6
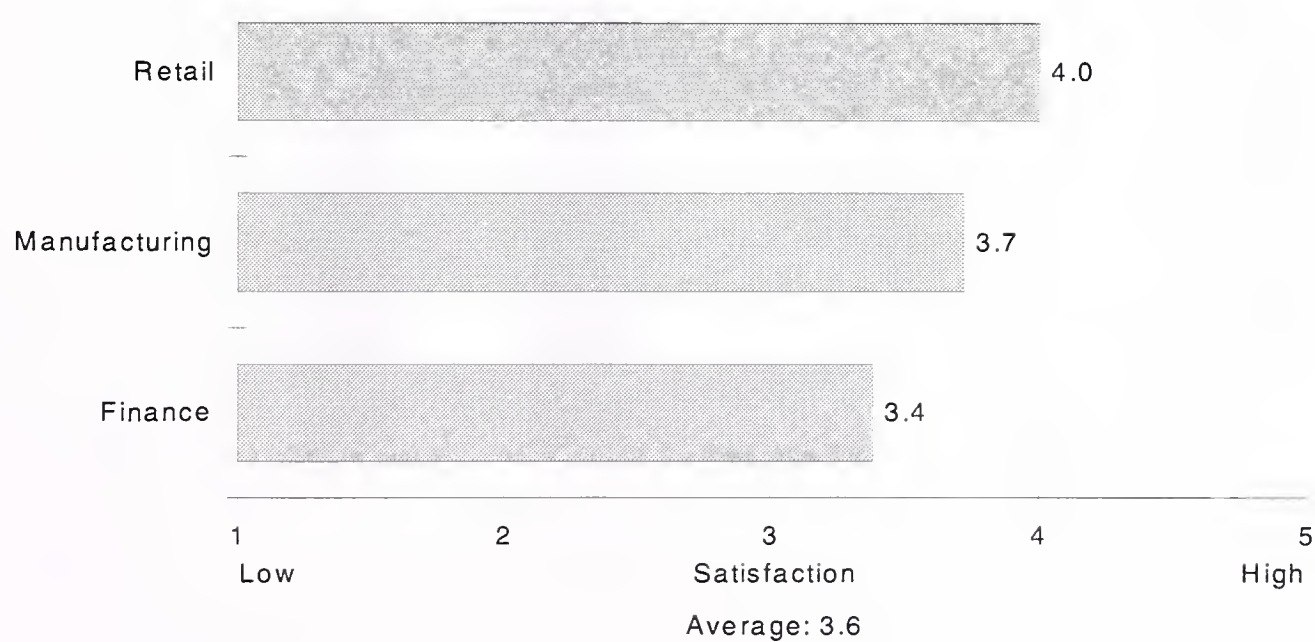
Sample: 48

Source: INPUT

Exhibit VIII-6

Overall Satisfaction With Application Hosting Services, US
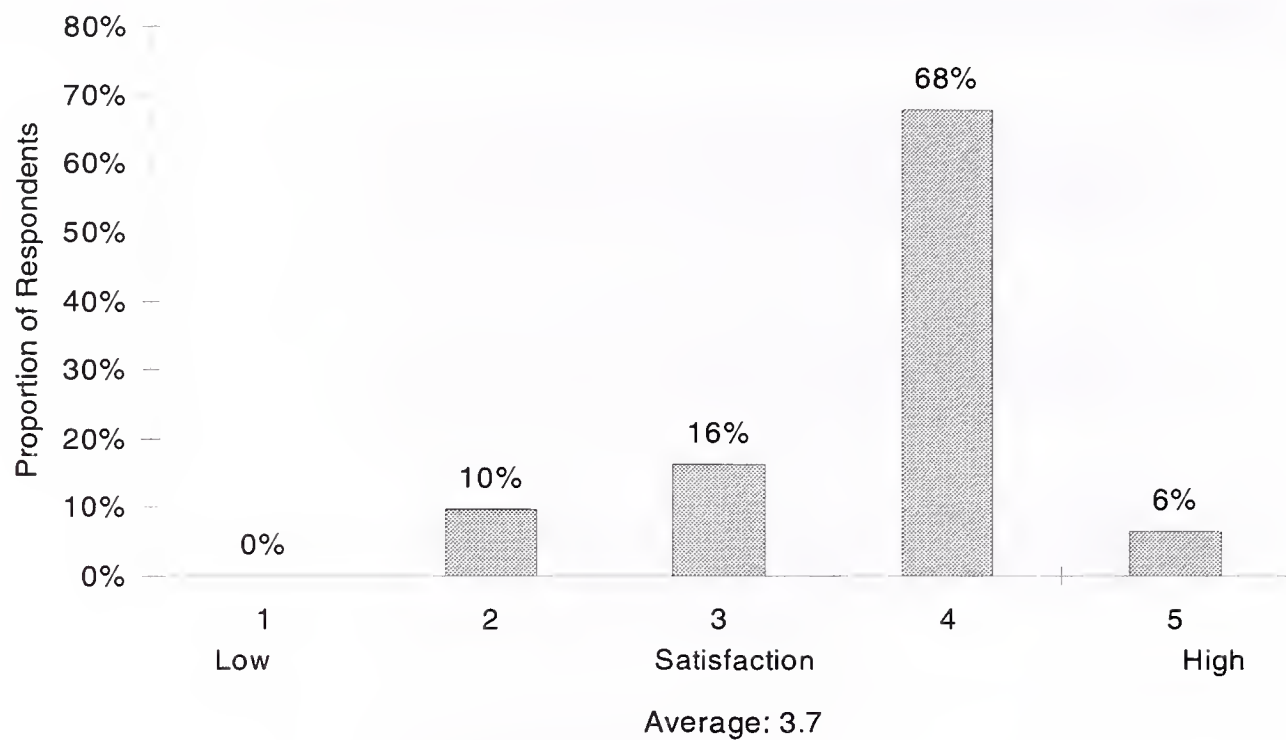
Sample: 31

Exhibit VIII-7

Overall Satisfaction With Application Hosting Services, Europe

Sample: 17

Exhibits VIII-8 to VIII-10 show how important respondents currently consider characteristics of application hosting services. Reflecting users' concerns with all hosting services, security and reliability issues top the list with very high ratings. US and European respondents share the same concerns at this high level.

Exhibit VIII-8

Current Importance of Application Hosting Characteristics, Worldwide

Characteristic	Rating
Application/data security	4.9
Reliability/uptime	4.6
Physical security	4.6
Server bandwidth	4.1
Service continuity	3.9
Service level agreements	3.6
Scalability	3.6
Cost	3.5
ISP flexibility	3.4
Mirroring/replication	3.3
ISP liability	3.2

```
1           2           3           4           5
Low                 Importance              High
```
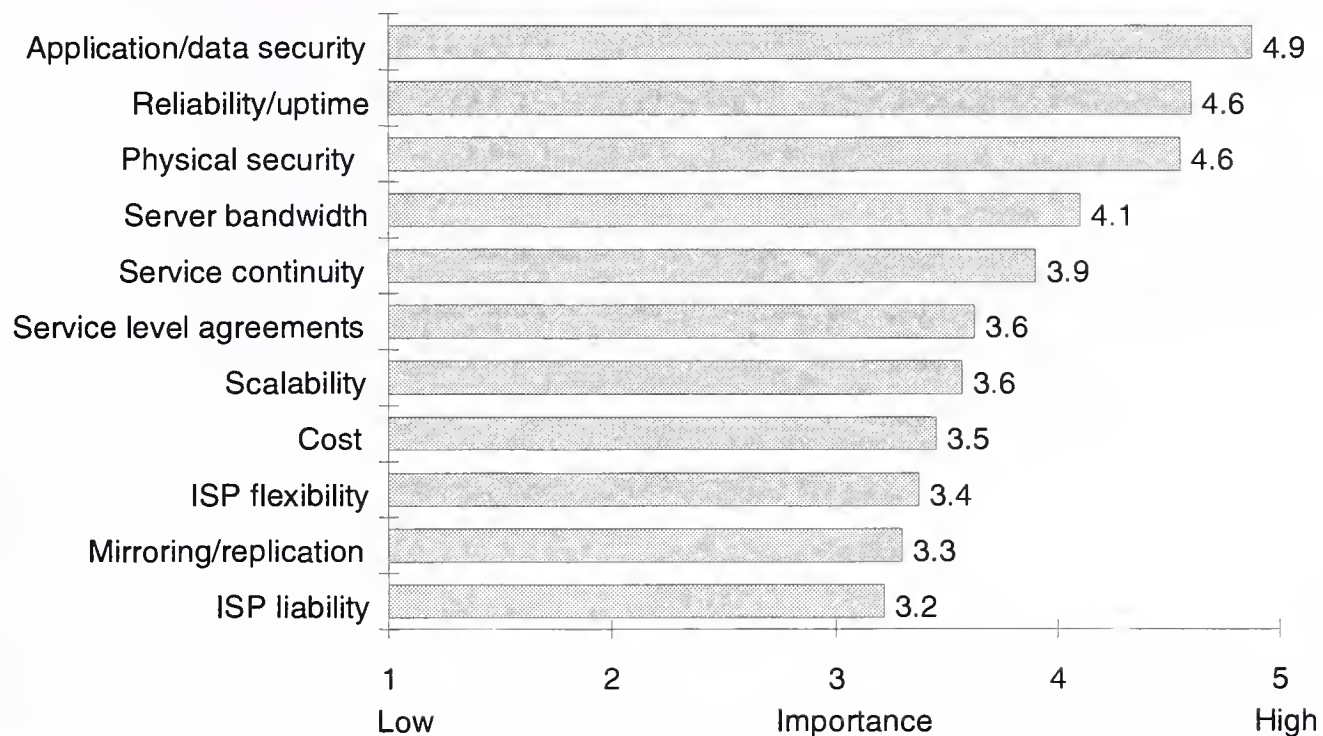
Sample: 40

Source: INPUT

Exhibit VIII-9

Current Importance of Application Hosting Characteristics, US

Characteristic	Value
Application/data security	5.0
Physical security	4.7
Reliability/uptime	4.6
Service continuity	4.0
Server bandwidth	4.0
Service level agreements	3.8
Scalability	3.7
Cost	3.6
Mirroring/replication	3.5
ISP liability	3.2
ISP flexibility	3.2

Axis: 1 (Low) — 2 — 3 (Importance) — 4 — 5 (High)
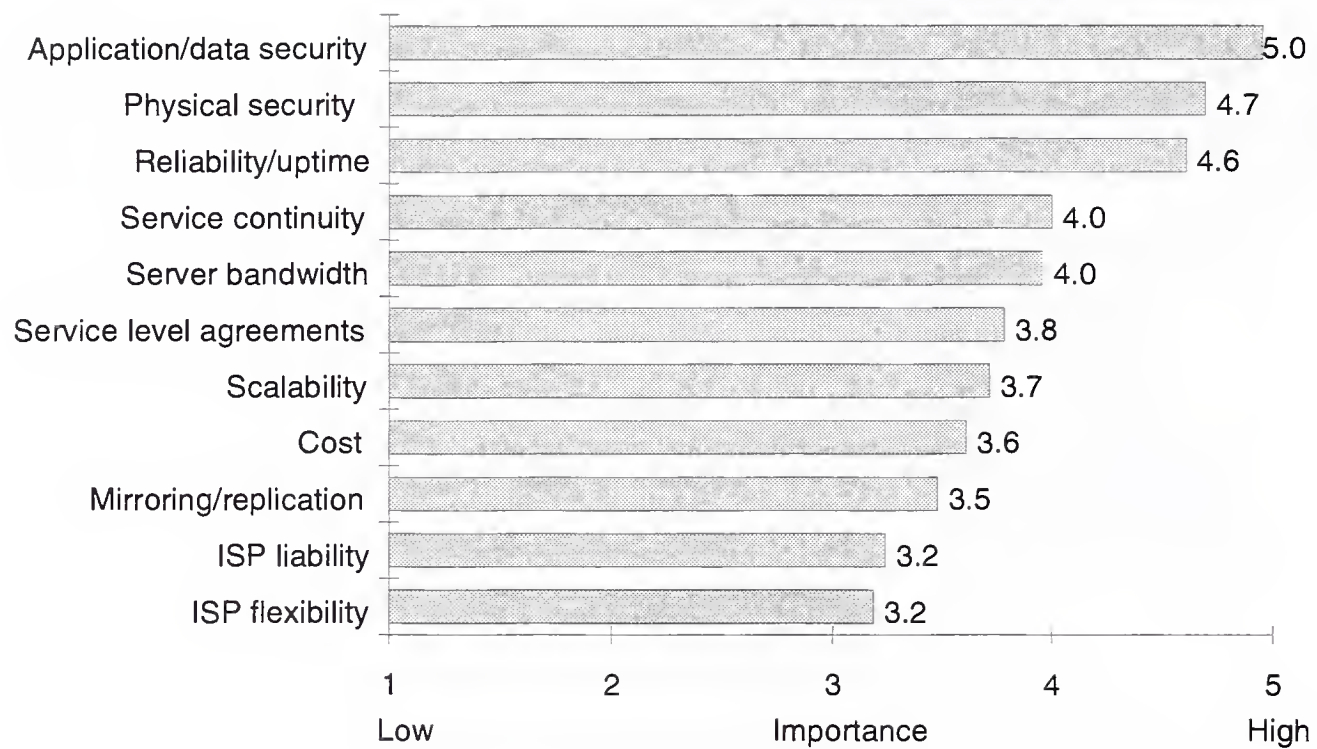
Sample: 23

Source: INPUT

Exhibit VIII-10

Current Importance of Application Hosting Characteristics, Europe

Characteristic	Value
Application/data security	4.8
Reliability/uptime	4.6
Physical security	4.4
Server bandwidth	4.3
Service continuity	3.8
ISP flexibility	3.6
Service level agreements	3.4
Scalability	3.4
Cost	3.2
ISP liability	3.2
Mirroring/replication	3.1

Axis: 1 (Low) — 2 — 3 (Importance) — 4 — 5 (High)
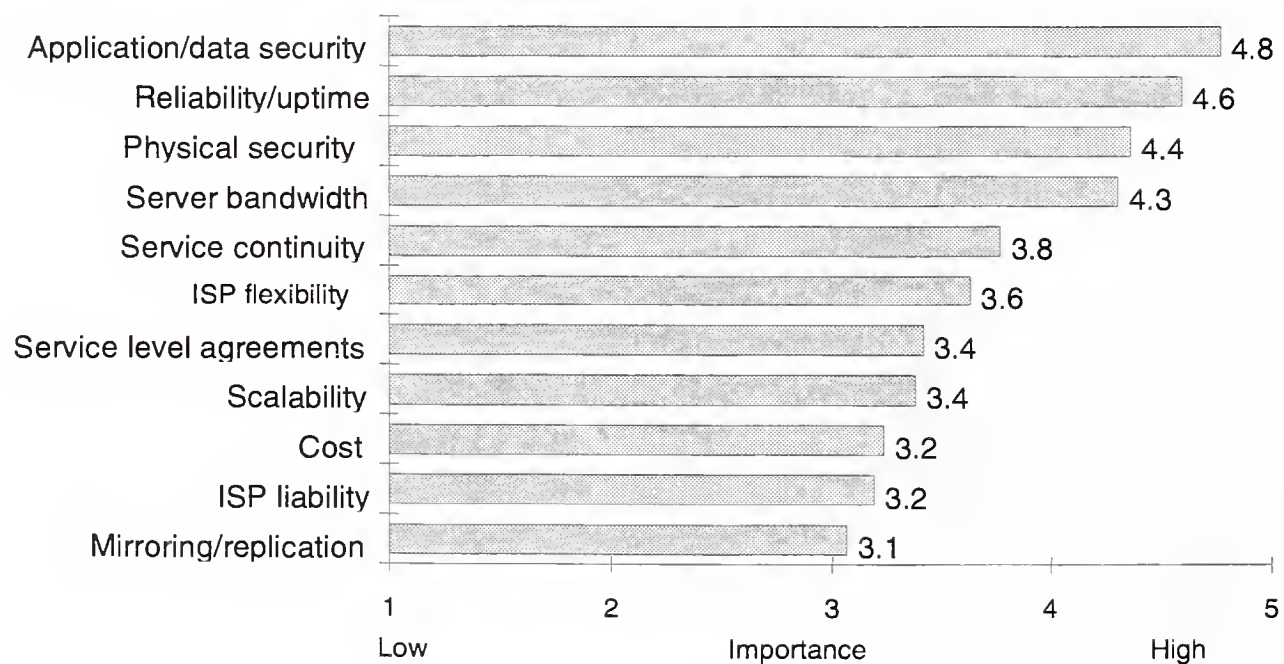
Sample: 17

Source: INPUT

Exhibits VIII-11 to VIII-13 show the expected importance of each characteristics by 2000, and Exhibit VIII-14 shows the difference between current and future importance. As with Web hosting services, buyers are looking to increase the capacity of their application servers—server bandwidth and scalability are the two components of an application hosting service expected to grow in importance more than other characteristics, to reach at least 4 out of 5 in all sectors.

Users will also place significantly increased emphasis on service continuity and service level agreements, and both issues will assume a high level of importance over the next two years.

The message to ISPs remains consistent: buyers first and foremost expect to receive a secure, reliable, and highly-available service. Additional features, though important, are secondary to these fundamental requirements.

Exhibit VIII-11

Expected Importance of Application Hosting Characteristics, 2000, Worldwide

	Importance
Application/data security	4.9
Reliability/uptime	4.8
Server bandwidth	4.7
Physical security	4.6
Service continuity	4.4
Scalability	4.2
Service level agreements	4.0
ISP liability	3.8
ISP flexibility	3.7
Mirroring/replication	3.7
Cost	3.6

1 Low — 2 — 3 Importance — 4 — 5 High
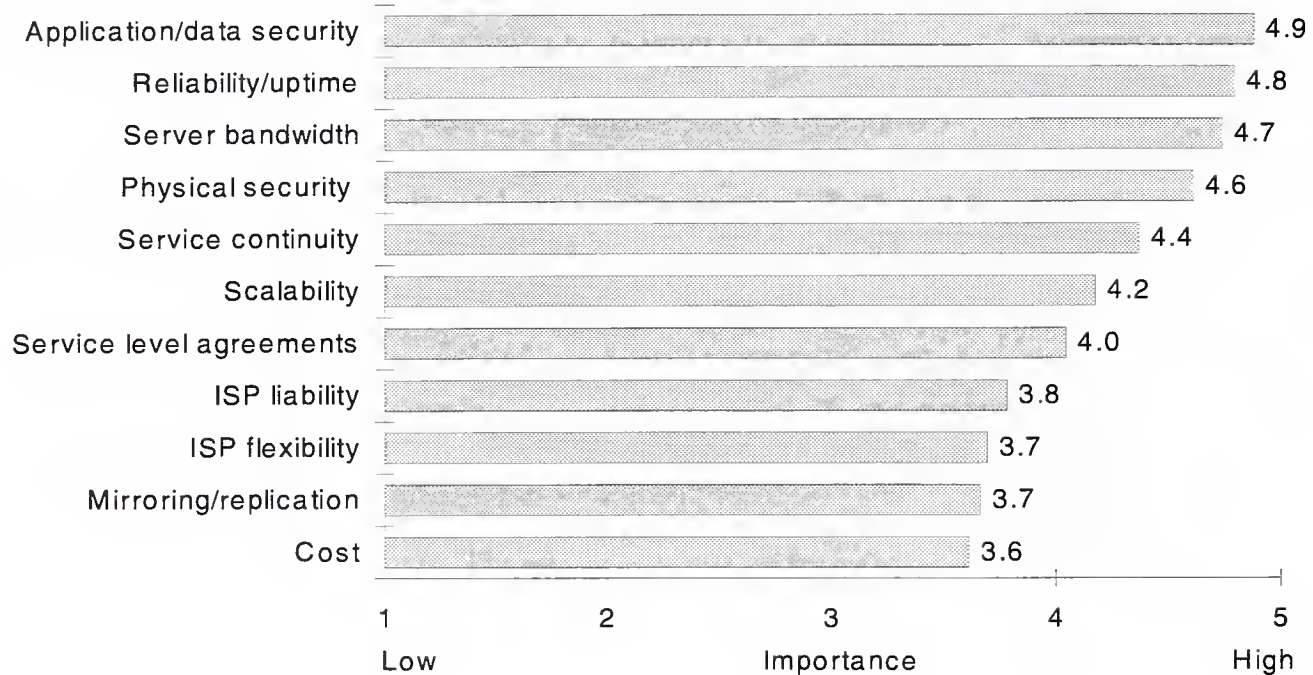
Sample: 77

Source: INPUT

Exhibit VIII-12

Expected Importance of Application Hosting Characteristics, 2000, US

	Importance
Application/data security	4.9
Reliability/uptime	4.8
Server bandwidth	4.6
Physical security	4.6
Service continuity	4.5
Scalability	4.4
Service level agreements	4.3
ISP liability	3.9
Cost	3.9
Mirroring/replication	3.9
ISP flexibility	3.8

1 Low — 2 — 3 Importance — 4 — 5 High
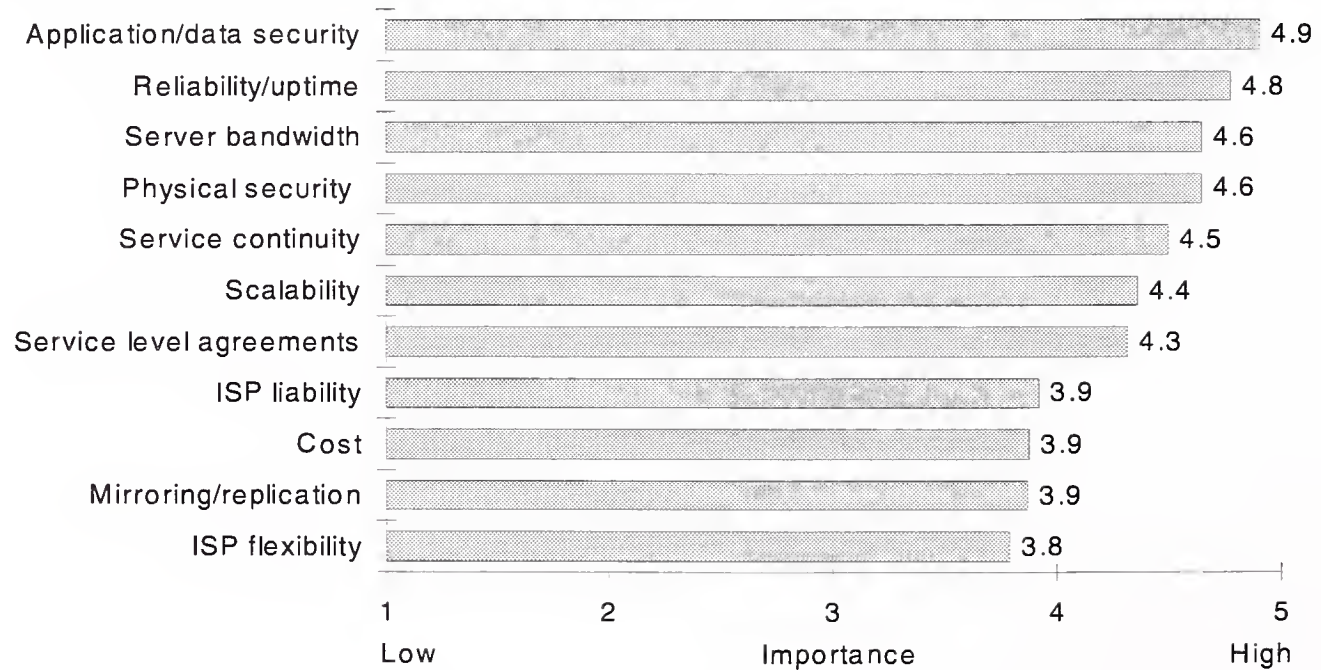
Sample: 39

Source: INPUT

EI18W

Exhibit VIII-13

Expected Importance of Application Hosting Characteristics, 2000, Europe

Characteristic	Value
Application/data security	4.9
Server bandwidth	4.8
Reliability/uptime	4.8
Physical security	4.6
Service continuity	4.2
Scalability	4.0
Service level agreements	3.8
ISP liability	3.6
ISP flexibility	3.6
Mirroring/replication	3.5
Cost	3.3

1 Low   2   3 Importance   4   5 High
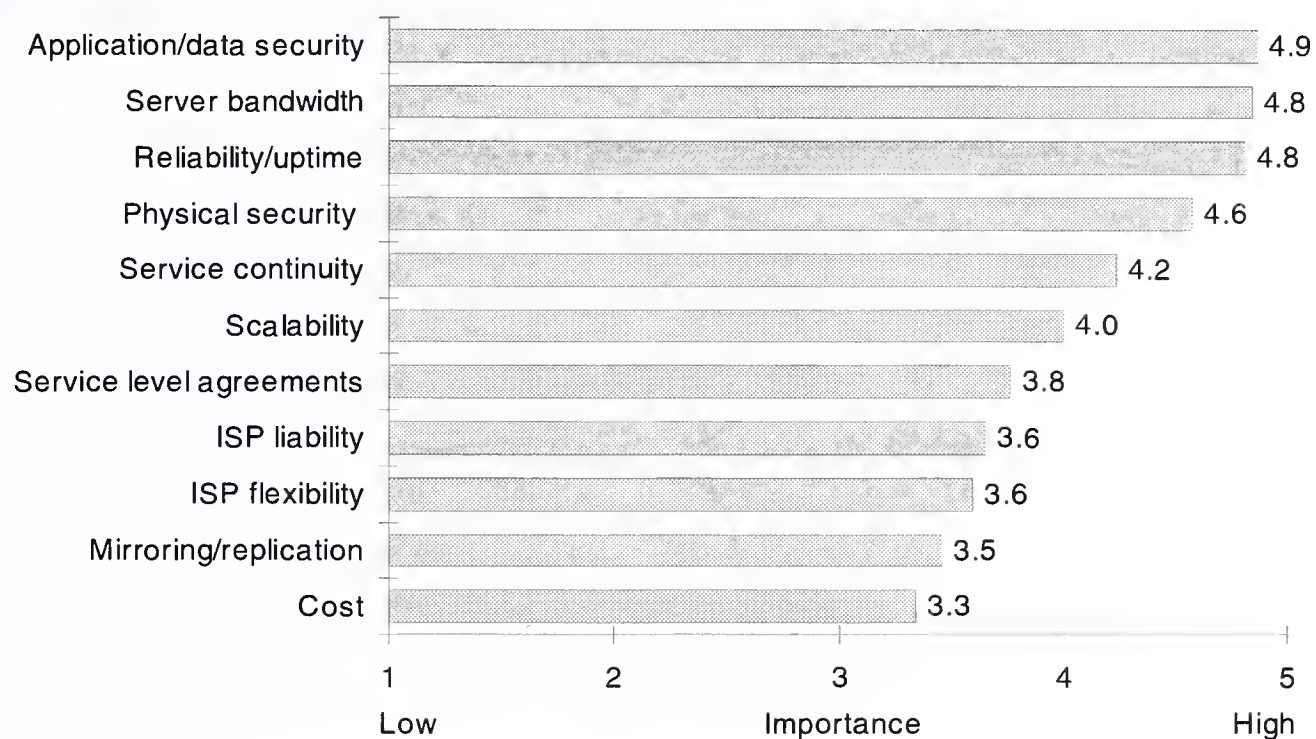
Sample: 38

Source: INPUT

Exhibit VIII-14

Expected Change in Importance of Application Hosting Characteristics, Worldwide

Characteristic	Value
Server bandwidth	0.6
Scalability	0.6
ISP liability	0.6
Service continuity	0.5
Service level agreements	0.4
Mirroring/replication	0.4
ISP flexibility	0.3
Reliability/uptime	0.2
Cost	0.2
Physical security	0.1
Application/data security	0.0

0.0   0.1   0.2   0.3   0.4   0.5   0.6   0.7
Expected Change in Importance
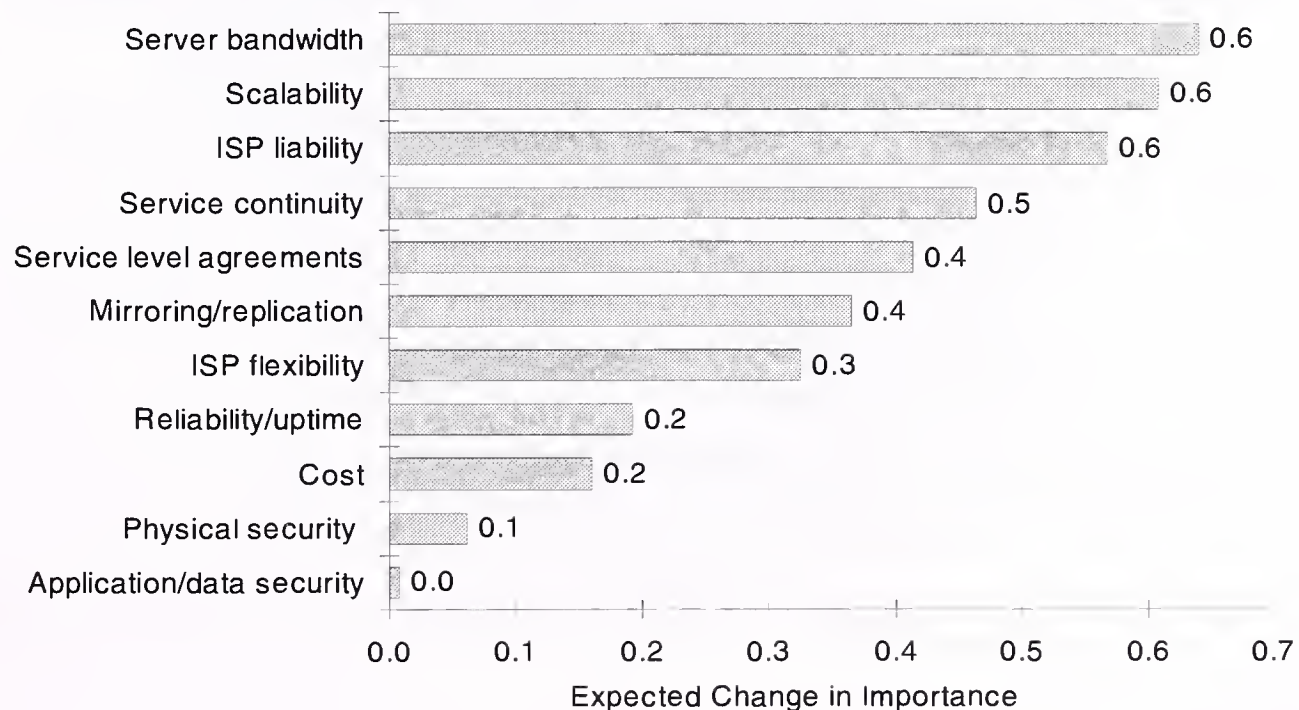
Sample: 77

Source: INPUT

Exhibits VIII-15 to VIII-17 show the satisfaction ratings given for application hosting service components; Exhibit VIII-18 shows the difference between the importance currently given to each characteristic and the satisfaction rating received.

Buyers are reasonably satisfied with the aspects of their application hosting services currently considered most important: security and reliability issues. In particular, the rating given by both US and European respondents to reliability/uptime is unusually high, averaging 4.5 out of 5.

However, buyers are less satisfied with the characteristics expected to increase considerably in importance: server bandwidth and scalability. The same pattern was observed with Web hosting services, and the same advice to ISPs applies. ISPs should take a proactive approach to managing customers' network and system capacity, recommend upgrades as applicable before capacity problems are encountered, and consult regularly with customers over application and related capacity requirements.

Exhibit VIII-15

Satisfaction With Application Hosting Characteristics, Worldwide

Characteristic	Satisfaction
Reliability/uptime	4.5
Application/data security	4.1
Physical security	4.0
Service continuity	3.8
Service level agreements	3.7
Scalability	3.5
Cost	3.5
Server bandwidth	3.5
ISP liability	3.3
ISP flexibility	3.3
Mirroring/replication	3.1

Scale: 1 Low — 2 — 3 Satisfaction — 4 — 5 High
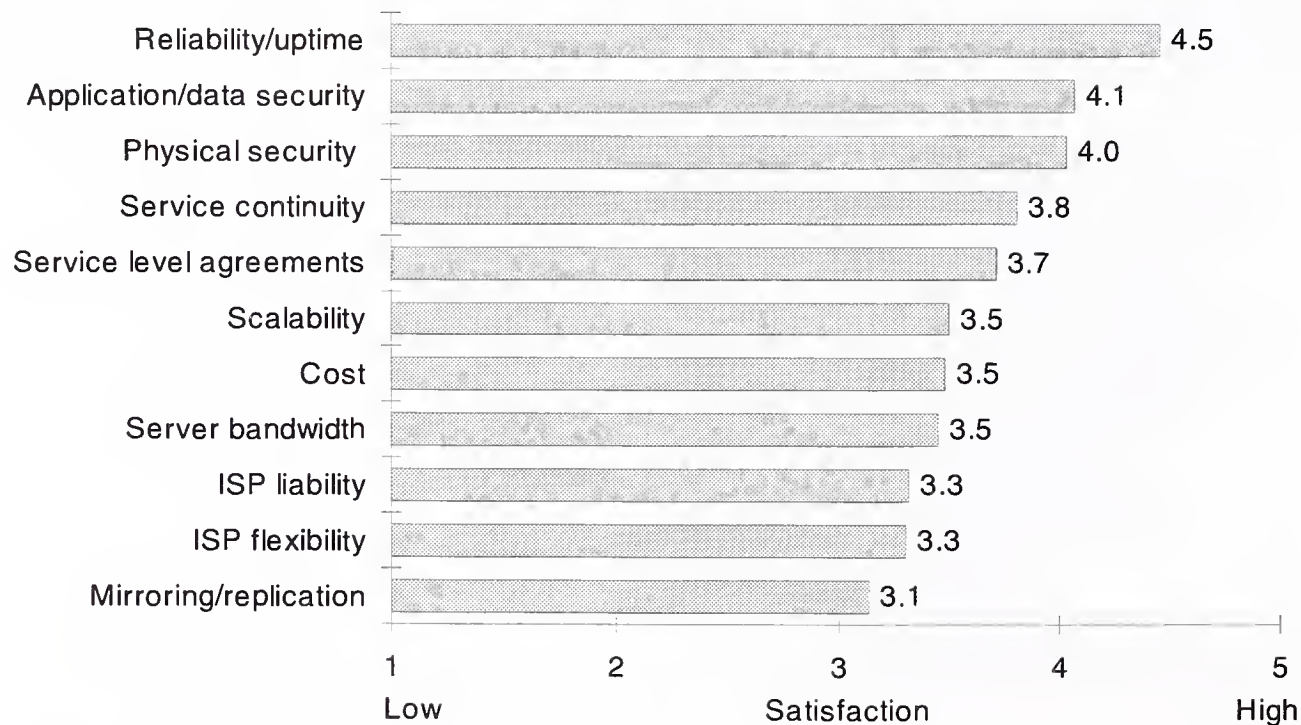
Sample: 31

Source: INPUT

Exhibit VIII-16

Satisfaction With Application Hosting Characteristics, US

Characteristic	Value
Reliability/uptime	4.4
Application/data security	4.0
Physical security	4.0
Service continuity	3.7
Service level agreements	3.7
Scalability	3.6
Server bandwidth	3.3
Cost	3.3
ISP liability	3.3
ISP flexibility	3.2
Mirroring/replication	3.1

1 Low   2   3 Satisfaction   4   5 High
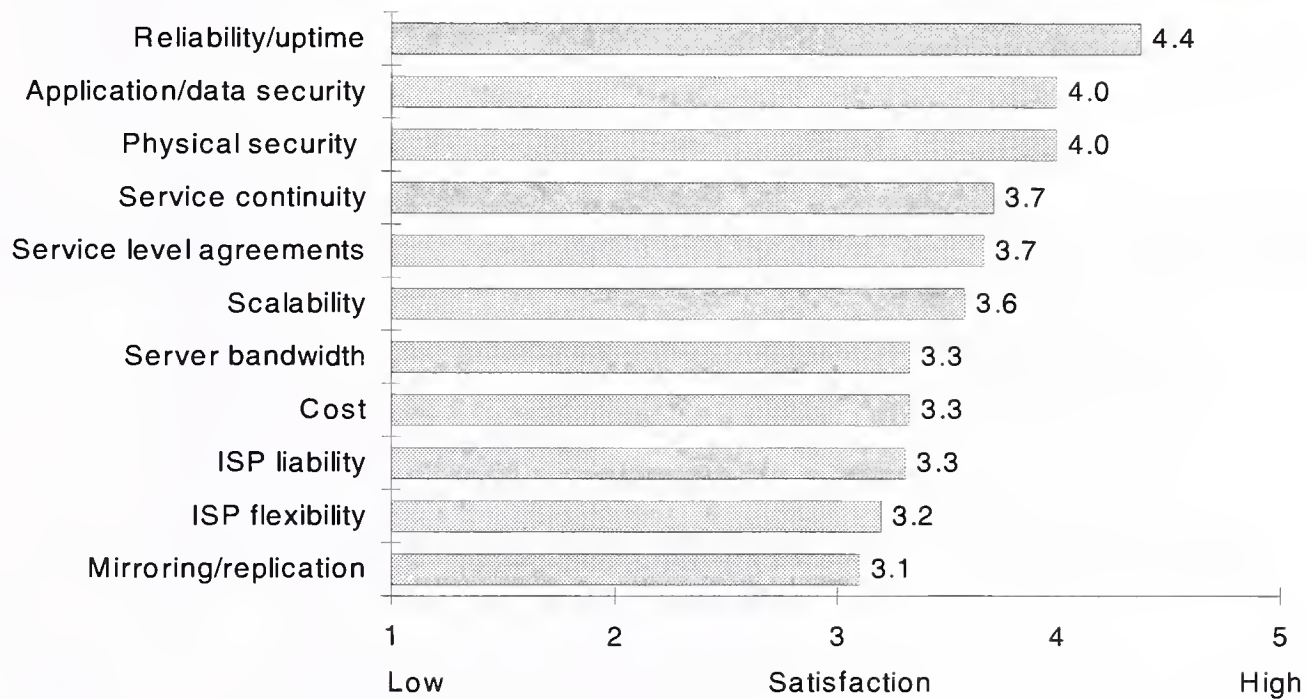
Sample: 21

Source: INPUT

Exhibit VIII-17

Satisfaction With Application Hosting Characteristics, Europe

Characteristic	Value
Reliability/uptime	4.6
Application/data security	4.2
Physical security	4.1
Service continuity	4.0
Service level agreements	3.8
Cost	3.8
Server bandwidth	3.7
ISP flexibility	3.6
Scalability	3.3
ISP liability	3.3
Mirroring/replication	3.2

1 Low   2   3 Satisfaction   4   5 High
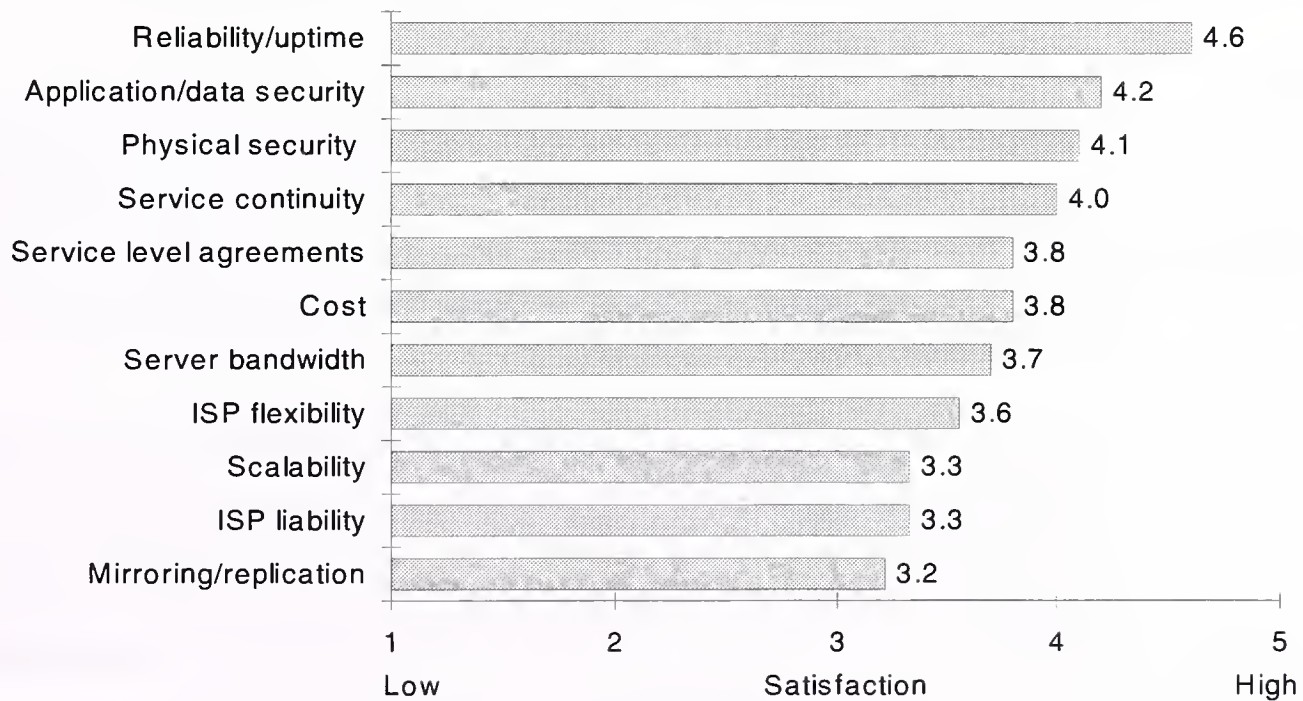
Sample: 10

Source: INPUT

Exhibit VIII-18

Difference Between Importance of and Satisfaction With Application Hosting Characteristics, Worldwide

ISP liability	0.1
Service level agreements	0.1
Cost	0.0
ISP flexibility	-0.1
Scalability	-0.1
Service continuity	-0.1
Reliability/uptime	-0.1
Mirroring/replication	-0.2
Physical security	-0.5
Server bandwidth	-0.6
Application/data security	-0.8

-1.0   -0.8   -0.6   -0.4   -0.2   0.0   0.2

Worse   Satisfaction vs Importance   Better
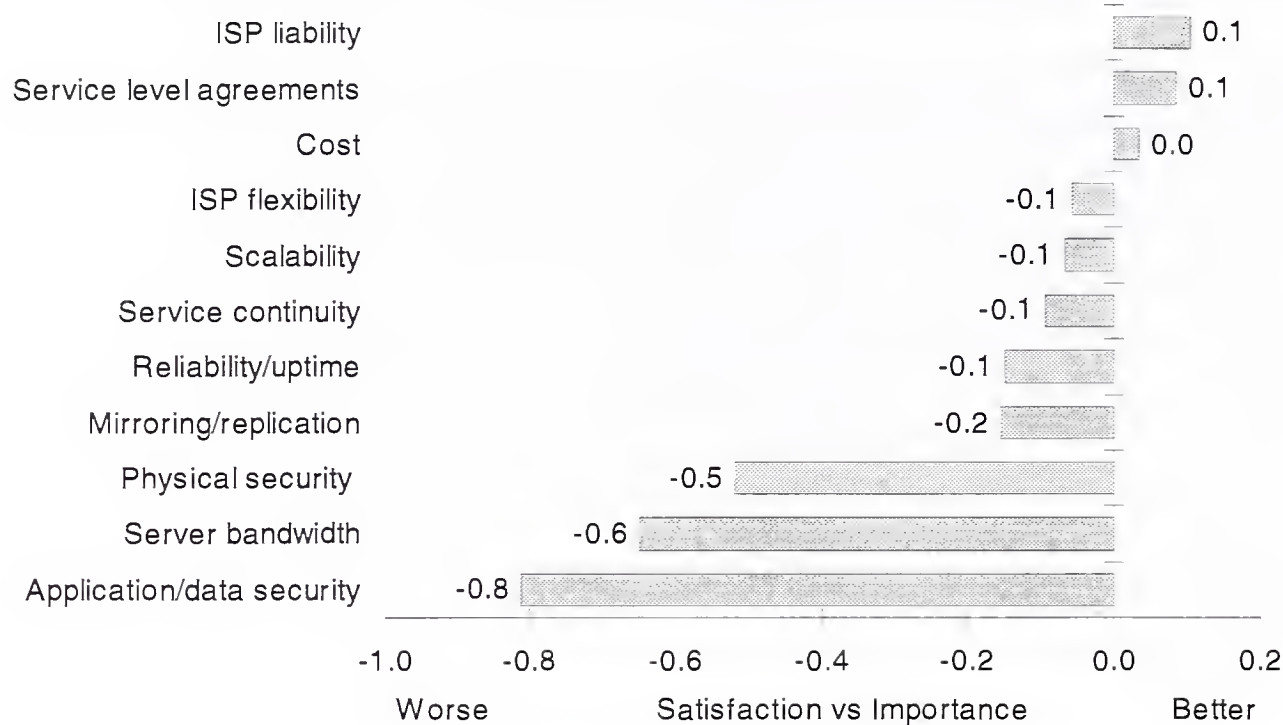
Sample: 40

Source: INPUT

C
Purchasing Criteria

Exhibit VIII-19 shows that users' primary criteria for purchasing application hosting services include the service components rated most importance: reliability and security. However, cost remains a check list item for purchasing decisions, despite the comparatively low importance attached to it, as shown above.

Several respondents stated that an ISP's experience in the application hosting market, and related credibility, is a primary criterion. This indicates the need for many ISPs without a solid background in application hosting to develop such services or, as INPUT believes is more likely, gain such services and good branding through acquisition.

A similar proportion of respondents stated the need for application integration skills and services. As applications hosted by ISPs increase in value beyond the low end to mission-critical enterprise applications,

buyers will increasingly need to perform back-end integration with existing, non-hosted applications and databases. Systems integration and consultancy services are required of ISPs by these users, and providers entering the ISP market from this background must capitalize on these skills.

Criteria Used for Purchasing Application Hosting Services, Worldwide

Criteria	Proportion of Mentions
Reliability	20%
Security	12%
Cost	12%
Scalability	11%
Experience	9%
Availability	9%
Integration with existing systems	8%
Technical skills	6%
Quality of management	6%
Fully-managed service	6%
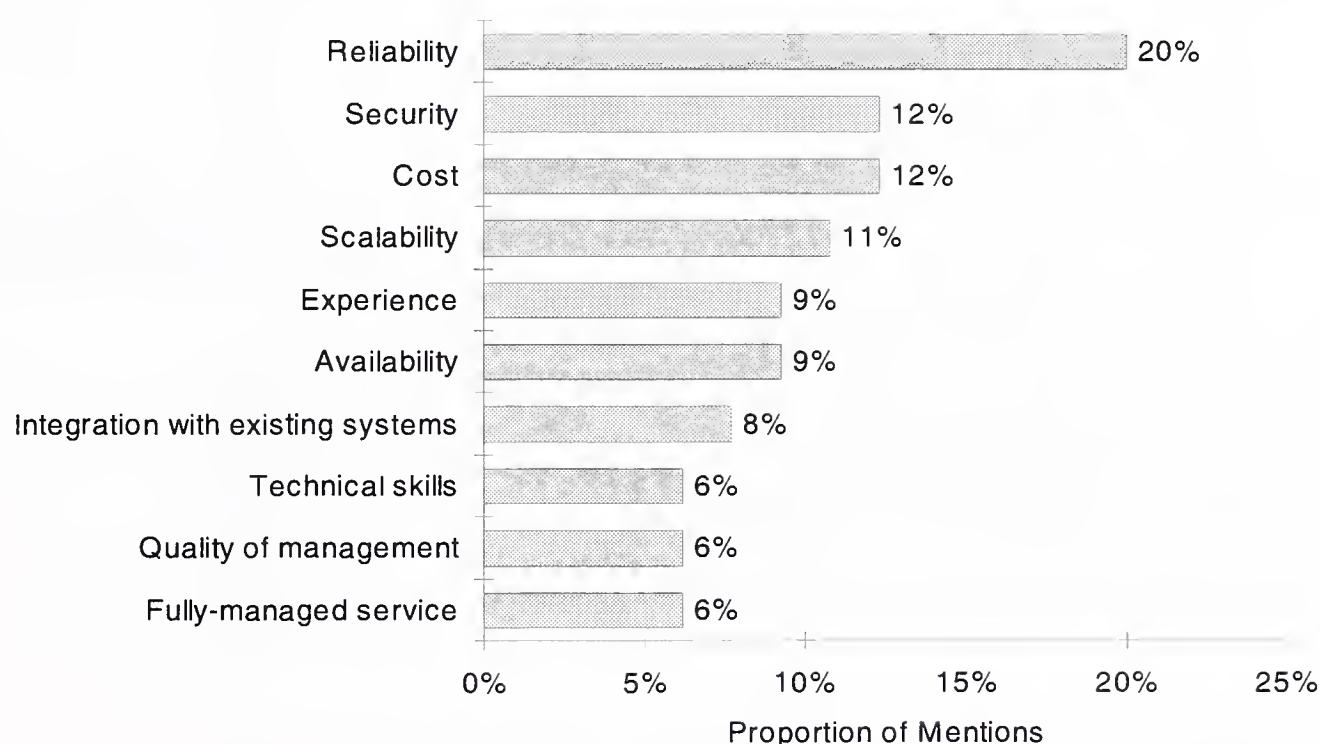
Sample: 65

Source: INPUT

Other criteria, mentioned by between one and three respondents, were:

- Advice service (not as part of consultancy service)

- Breadth of services

- Focus on business issues

- Commercial sensitivity

- Commitment to long-term relationship

- Credibility

- Customer service

- Development services

- Integration with EDI services

- Extranet ability

- Flexibility

- Global presence

- Integrated hosting and Internet access services

- Openness of information

- Performance

- Quality of infrastructure

- Setting of realistic expectations

- Responsiveness

- Service level agreements

IX
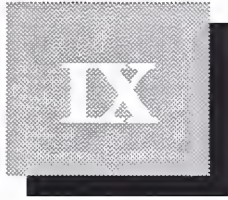
Extranet Service Usage and Plans

A
Current and Future Usage

As shown earlier in this report, use of Extranet services within the survey sample is expected to double in the next two years. Growth of the Extranet market overall will be even higher, however, due to this survey's sample characteristics—respondents were already active users of Internet services at the time of interviewing. In using Extranet services, buyers seek to replace high-cost VPNs from non-Internet providers and private WAN connections operated in-house.

In the US, around 30% of respondents currently use an Extranet service, and the figure in Europe is approximately 10%. By 2000 these figures are expected to increase to around 45% for both regions.

Current and planned use of individual Extranet service components is shown in Exhibits IX-1 to IX-3. Use of these components is consistent across respondents. Buyers regard these as standard components of Extranet services; no component is regarded as unimportant.

Exhibit IX-1

Current and Expected Use of Extranet Services, Worldwide

Proportion of Respondents

- Secure Internet tunnelling: 11% (1998), 31% (2000)
- Corporate messaging services: 13% (1998), 32% (2000)
- Corporate directory services: 11% (1998), 34% (2000)
- Remote Intranet access: 13% (1998), 31% (2000)
- Remote other-LAN access: 12% (1998), 24% (2000)
- Commerce capability: 10% (1998), 30% (2000)

1998 2000
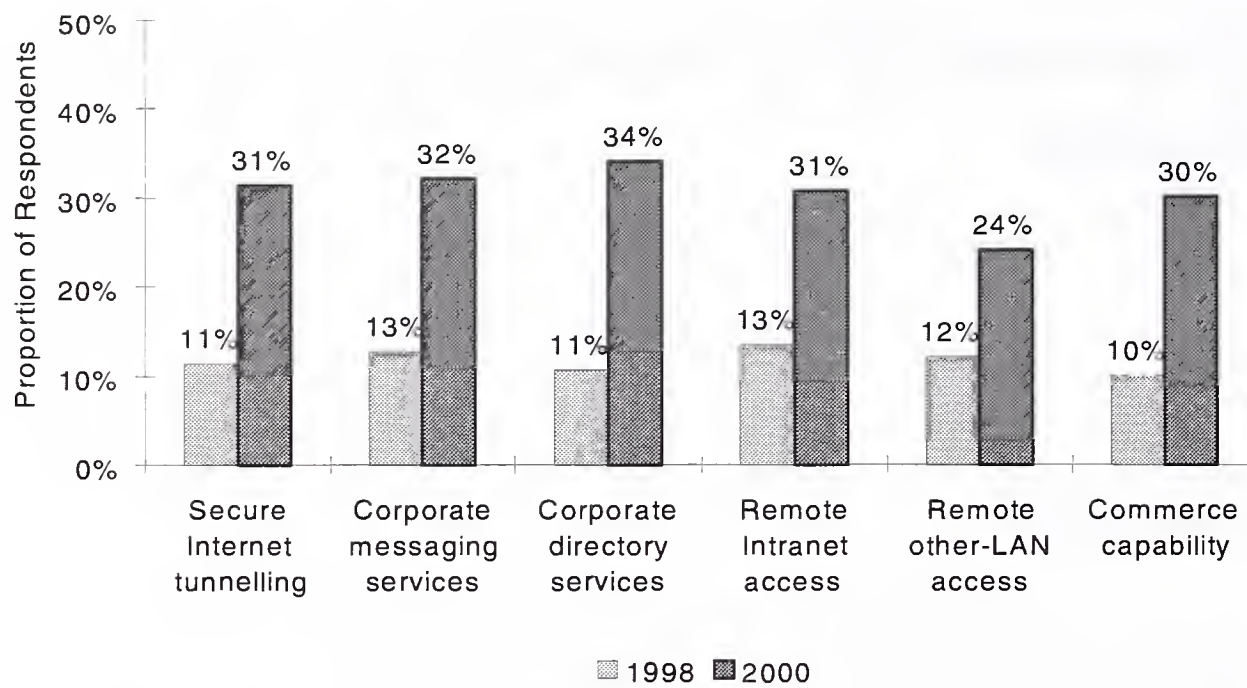
Sample: 150

Source: INPUT

Exhibit IX-2

Current and Expected Use of Extranet Services, US

Proportion of Respondents

- Secure Internet tunnelling: 16% (1998), 32% (2000)
- Corporate messaging services: 17% (1998), 28% (2000)
- Corporate directory services: 13% (1998), 29% (2000)
- Remote Intranet access: 19% (1998), 32% (2000)
- Remote other-LAN access: 15% (1998), 20% (2000)
- Commerce capability: 12% (1998), 27% (2000)

1998 2000

Sample: 75

Source: INPUT

110
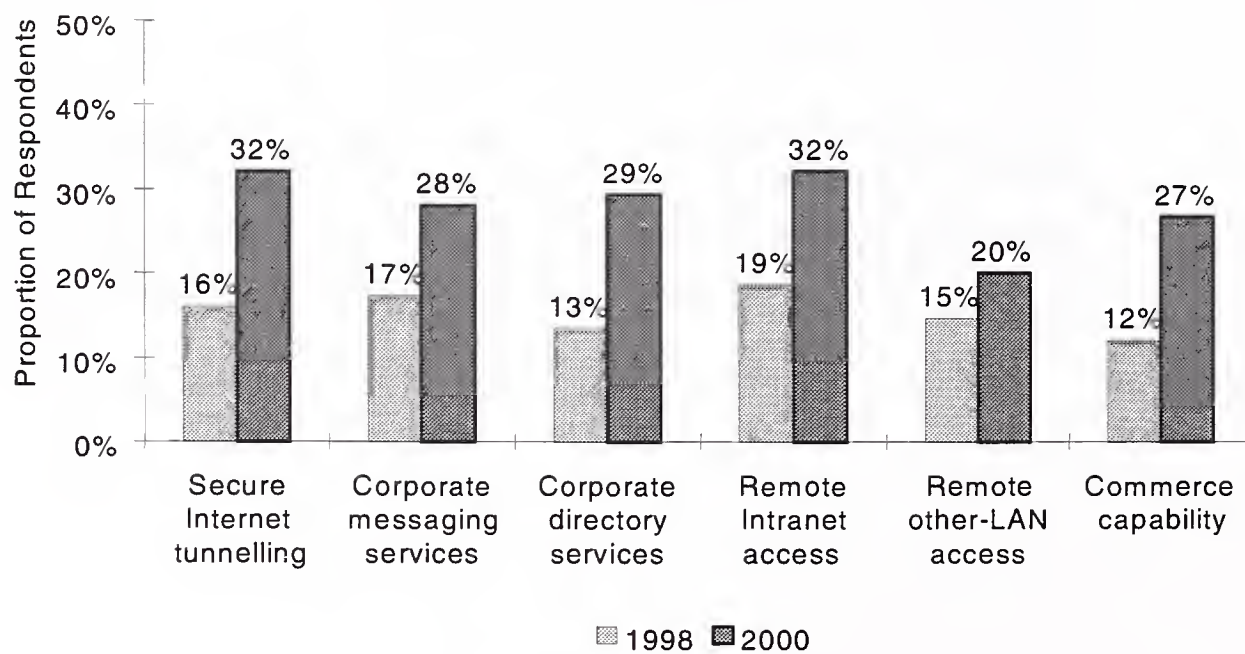
Exhibit IX-3

Current and Expected Use of Extranet Services, Europe
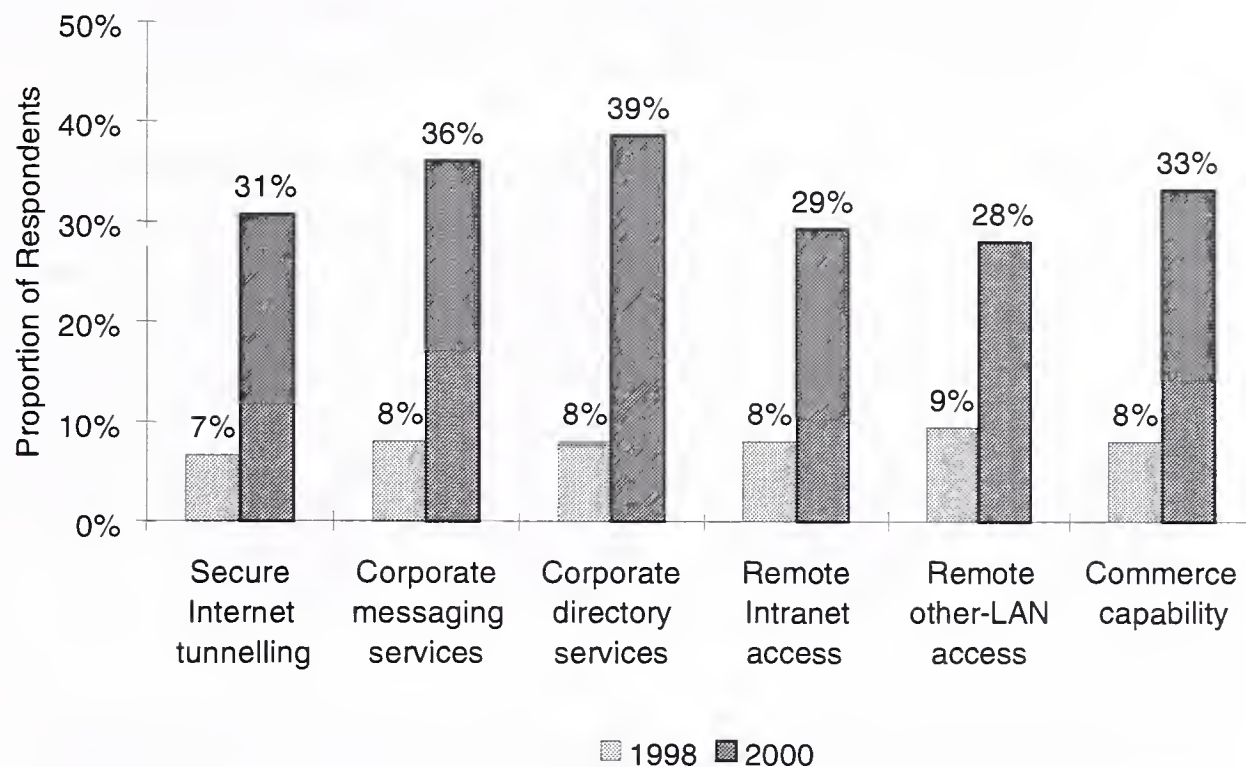
Sample: 75

B

Best VPN Implementation Methods

Respondents were asked which method of implementing a VPN (Internet or non-Internet) was most appropriate to their organization. Exhibits IX-4 to IX-6 show there is a marked difference of views between US and European organizations. US respondents stated that an Internet-based, ISP-provided service is most appropriate, both currently and in two years' time.

European organizations currently do not regard an external Internet service-based approach as appropriate. Instead they consider in-house VPN provision using self-developed or standard products the most suitable method. Within two years, this will change significantly, and European organizations expect to be able to make use of ISP Extranet services.

The reason for this is that ISP Extranet services are currently more advanced in the US than in Europe. Many ISPs offering Extranet services restrict coverage to the national (primarily US) market, with

international availability handled on a case by case basis. This is due to the private, highly confidential nature of Extranet communications. Many ISPs restrict Extranet traffic to their own networks and do not route it over the public Internet where they can offer no guarantee of security or performance. As a result, geographic coverage is limited.

This provides another argument for market consolidation. Basic Internet access can, and is, provided adequately by ISPs who route traffic across disparate networks operated by competitors and by non-competitors. To provide an Extranet service with security and performance guarantees, the role of an ISP's own network becomes much more important. Larger ISPs are better placed to offer such services due to the extent of their networks. As ISPs grow through acquisitions, their ability to provide widespread Extranet services increases.

Exhibit IX-4

Most Appropriate VPN Implementation Method, Worldwide
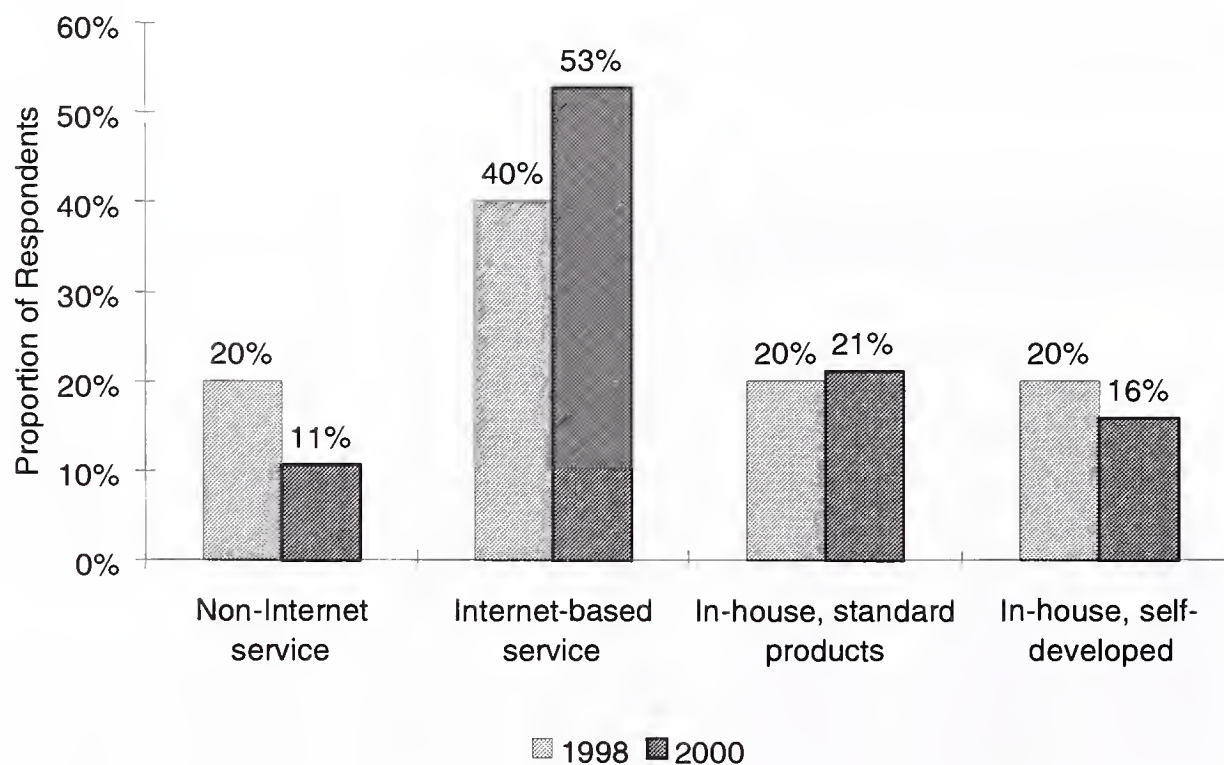
Sample: 57

Source: INPUT

Exhibit IX-5

Most Appropriate VPN Implementation Method, US
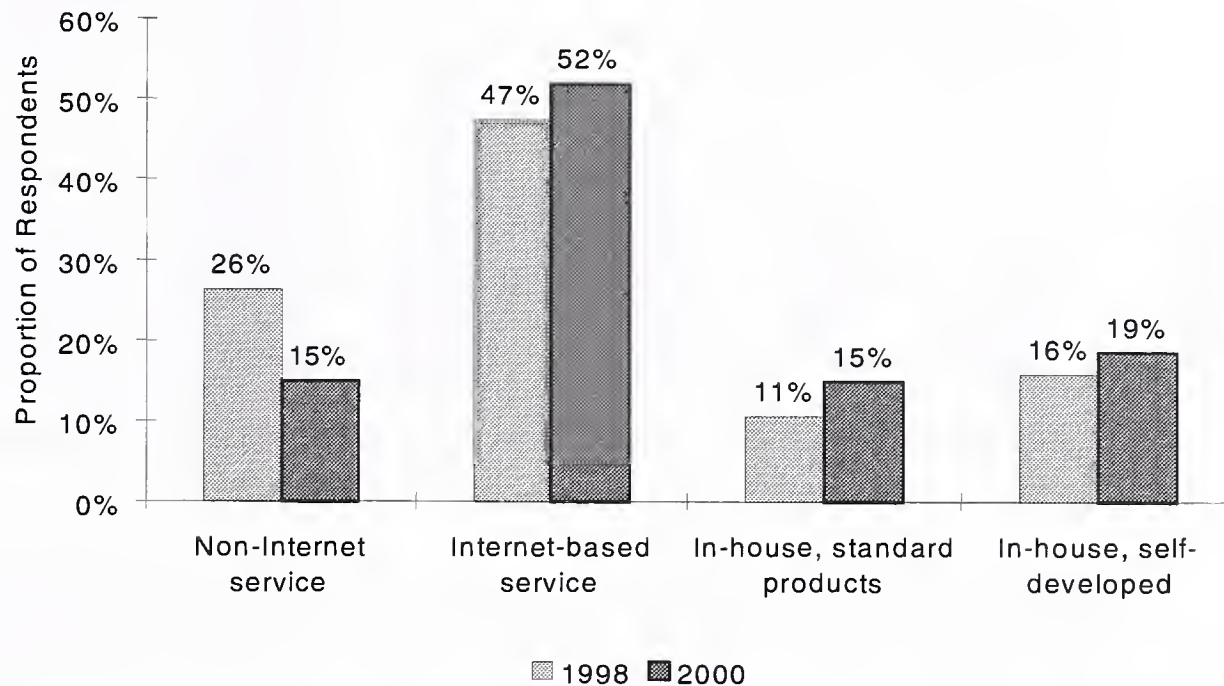
Sample: 27

Exhibit IX-6

Most Appropriate VPN Implementation Method, Europe
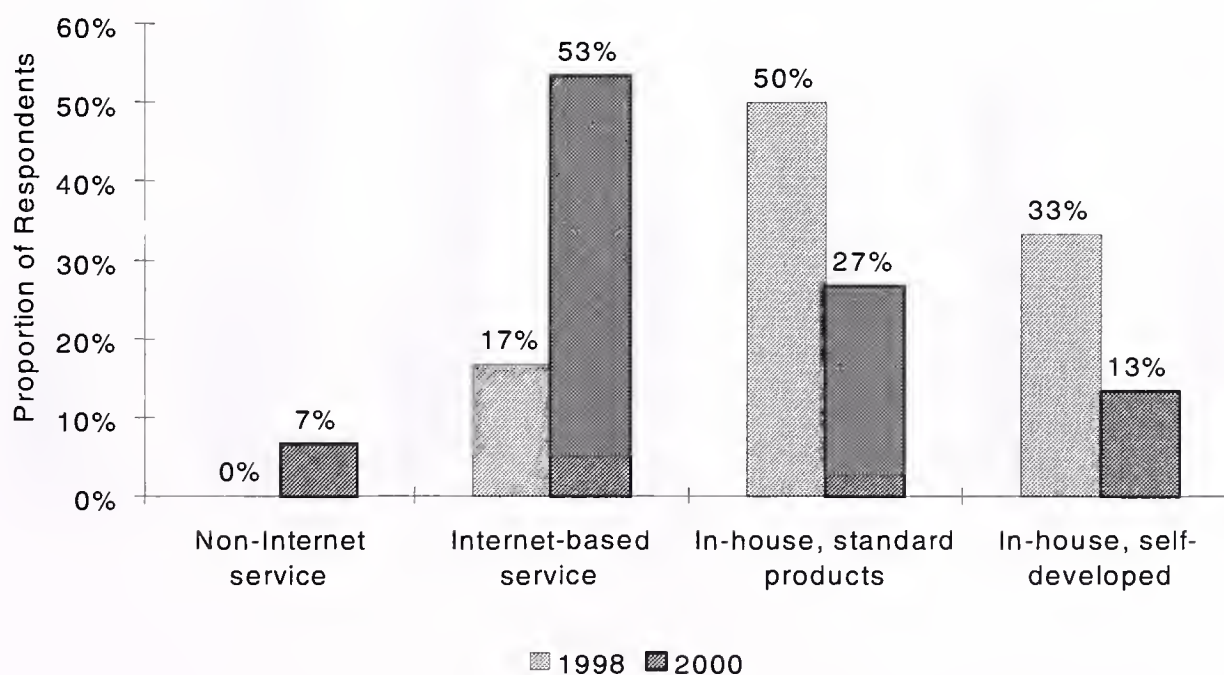
Sample: 30

C

Scope of Extranet Deployment

Extranets connect physically separated Intranets. Connected Intranets may belong to one company (a geographically disperse private Intranet), or different companies (trusted parties which seek to gain benefit by accessing each others' data and/or applications).

Exhibits IX-7 to IX-9 show the types of organization that respondents currently and plan to connect to via an Extranet. Interestingly, despite the attention given to the potential of Extranets to connect partners, customers, and suppliers, buyers are focused internally. Connecting branch offices to corporate headquarters is the focus for users that are already using an Extranet service. Currently, external organizations such as partners, suppliers, and customers are secondary.

By 2000, still most Extranet coverage will be internal, with approximately one in six of large companies connecting to partners, customers, or suppliers.

This provides an opportunity for ISPs and technology vendors (alone or in partnership) to bid for enterprise-wide service contracts that cover one company's disperse offices, as opposed to multiple organizations.

Exhibit IX-7

Current and Expected Scope of Extranet Deployment, Worldwide
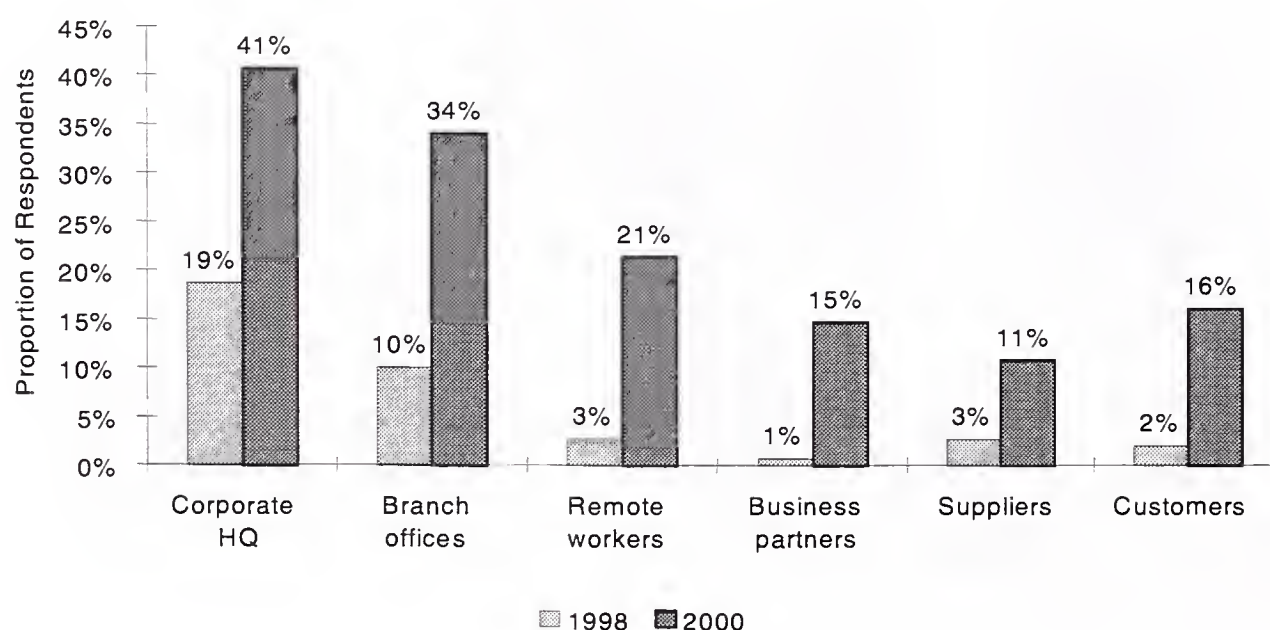
Sample: 150

Source: INPUT

Exhibit IX-8

Current and Expected Scope of Extranet Deployment, US
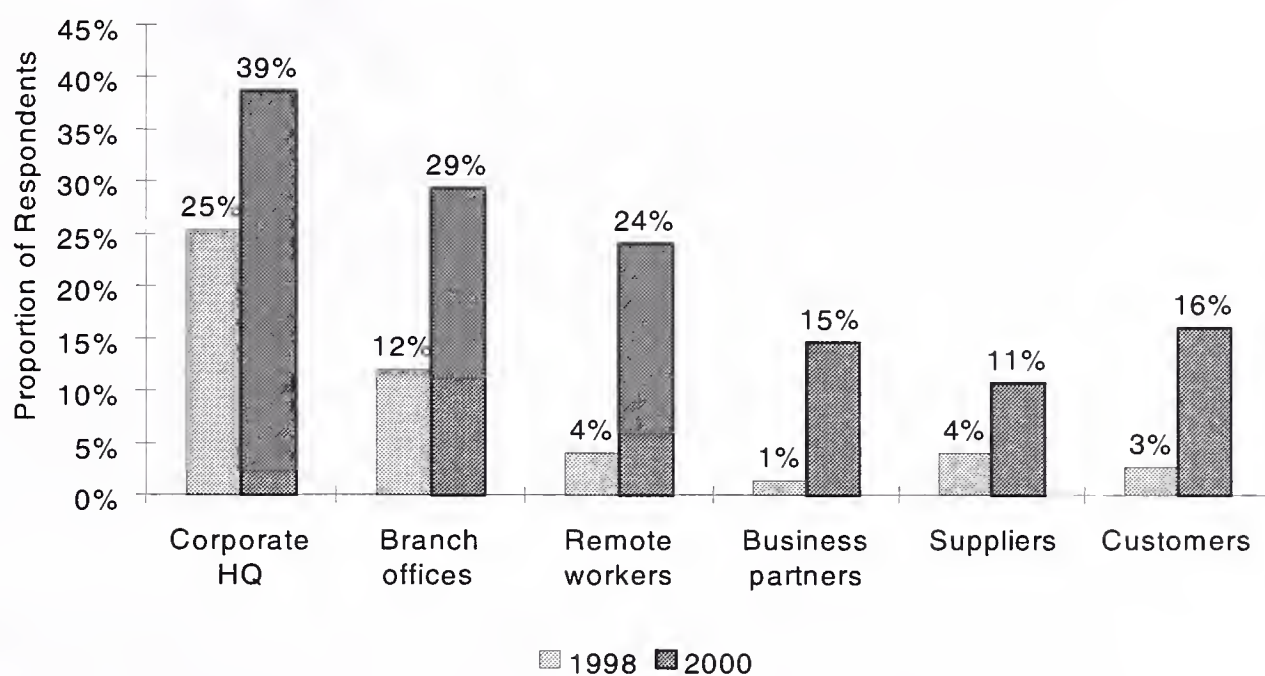
Sample: 75

Source: INPUT

Exhibit IX-9

Current and Expected Scope of Extranet Deployment, Europe
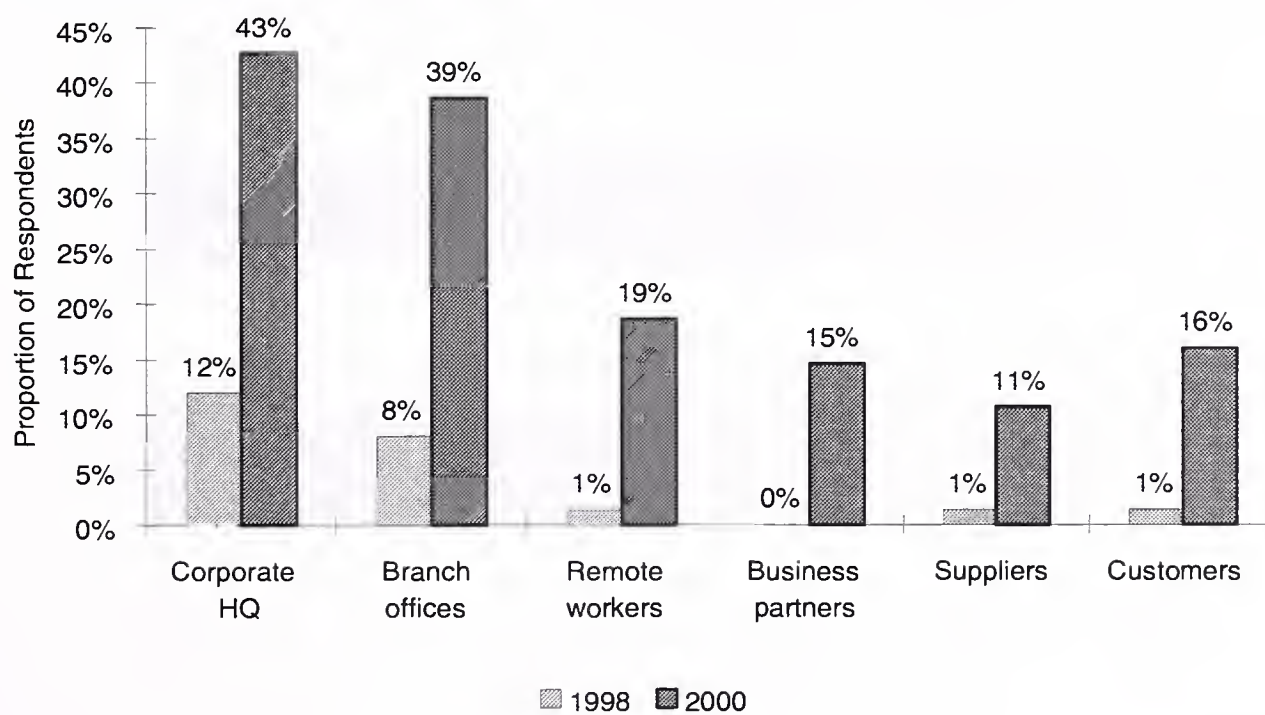
Sample: 75

Source: INPUT

D

ISP Consistency

Robust, internationally-available Extranet services are not yet offered by most ISPs, and are an integrated component of very few ISP's standard offerings. More so than for Web or application hosting services, buyers tend to seek a specialized supplier of Extranet services, different from their corporate Internet access provider. Exhibit IX-10 shows the current use of the same ISP for Internet access and Extranet services.

As the Extranet market matures, the ISP market consolidates into fewer, larger providers, and Extranet capabilities become a standard component of ISP offerings, more buyers will use one ISP for multiple services, including Extranets.

Few respondents gave their reasons for using a different ISP for Extranet services than for Internet access. Those who did were unconfident of their ISP's ability to provide an Extranet service or were concerned over their ISP's lack of experience in this area.

Exhibit IX-10

Use of Same ISP for Internet Access and Extranet Services
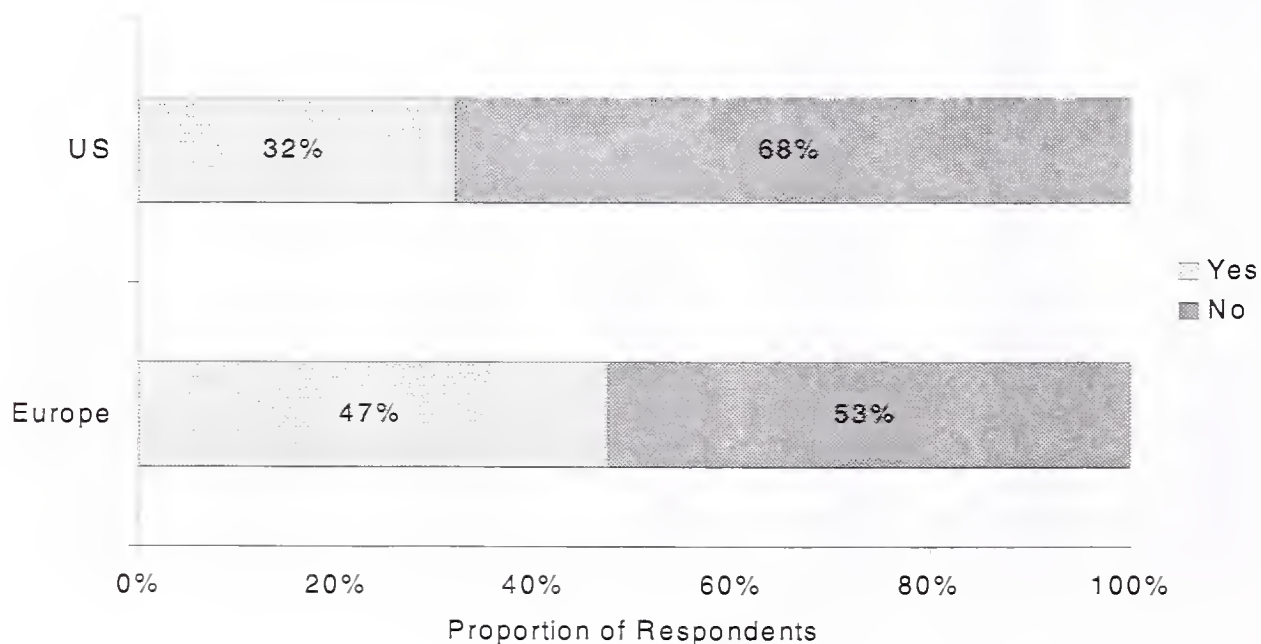
Sample: 44

Source: INPUT

X
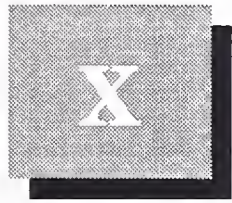
Extranet Benefits, Satisfaction, and Criteria

A
Benefits

Exhibits X-1 to X-3 show how significant buyers regard the benefits of using Extranets and of using ISP-provided Extranet services compared with in-house provision. By far the greatest perceived benefit is inherent to Extranets themselves—without the Internet as a low-cost, open, and ubiquitous network platform, users would not be able to connect to other organizations without costly private and/or proprietary WAN services. By using the Internet to connect their branches and other organizations, new business methods ensue such as low-cost, rapid communication, information sharing, and commerce.

Buyers are less concerned over other potential benefits. Replacement of existing VPNs and WANs is significant for organizations with those services.

Too few European respondents currently use an Extranet service to be able to measure to what degree benefits have been realised, but the significance of potential benefits can be measured.

Exhibit X-1

Extranet Service Benefits, Worldwide

Enablement of new business methods — 4.2 / 3.6
Low-cost extension of current network — 3.7 / 3.2
Overall cost savings — 3.6 / 3.4
Replacement of existing WAN — 3.2 / 3.6
Replacement of existing VPN — 2.4 / 2.8

Significance
Realization

1 2 3 4 5
Low   Significance/Realization   High
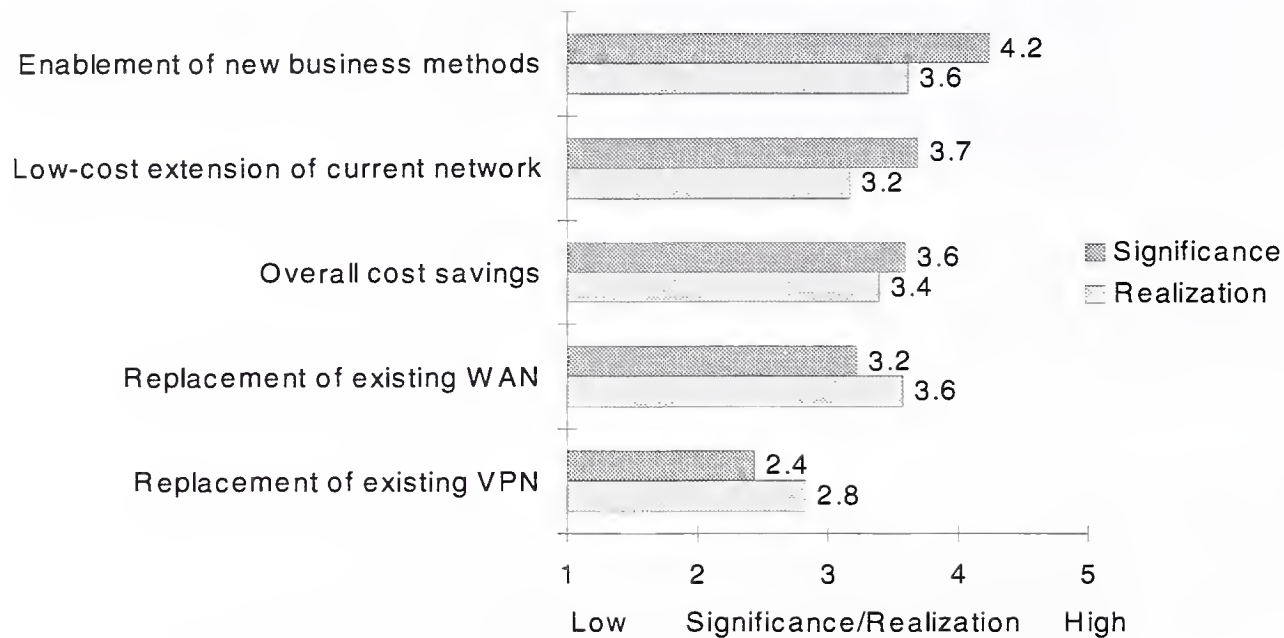
Sample: 61

Source: INPUT

Exhibit X-2

Extranet Service Benefits, US

Enable new business methods — 4.3 / 3.7
Overall cost savings — 3.9 / 3.4
Extend (not replace) current network at low cost — 3.7 / 3.2
Replace existing intra-company WAN — 3.5 / 3.7
Replace existing non-Internet VPN service — 2.5 / 2.9

Significance
Realization

1 2 3 4 5
Low   Significance/Realization   High
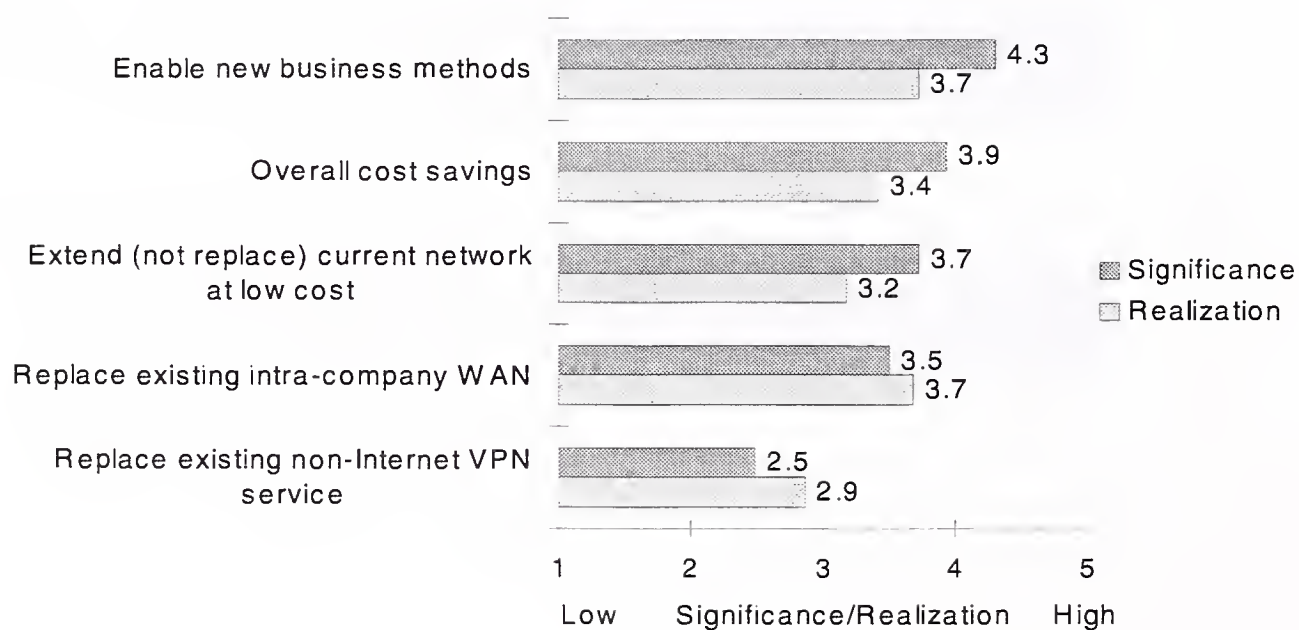
Sample: 30

Source: INPUT

118

Exhibit X-3

Extranet Service Benefits, Europe

Enable new business methods — 4.2

Extend (not replace) current network at low cost — 3.7

Overall cost savings — 3.3

Replace existing intra-company WAN — 3.0

Replace existing non-Internet VPN service — 2.4

1   2   3   4   5

Low   Significance   High
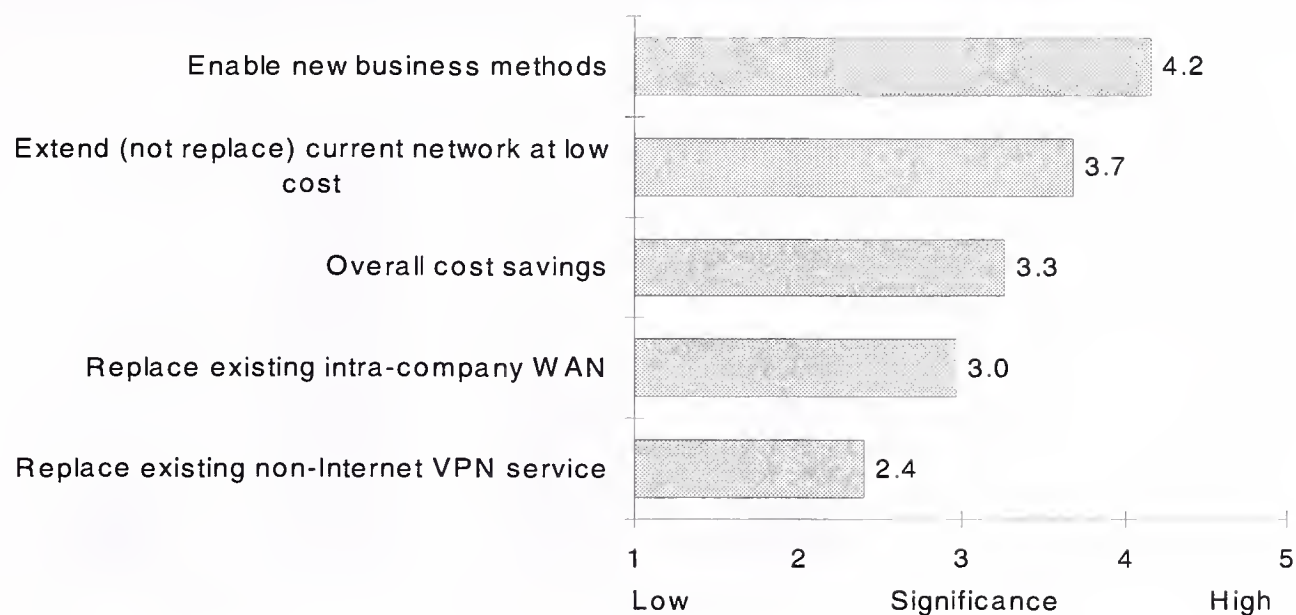
Sample: 31

Source: INPUT

B

Satisfaction

Only a small number of respondents gave a satisfaction rating to their existing Extranet service; their responses are shown in Exhibit X-4. Overall, buyers are reasonably satisifed with the service they receive.

Exhibit X-4

Overall Satisfaction With Extranet Services

Proportion of Respondents

Average: 3.4

Sample: 18

Source: INPUT
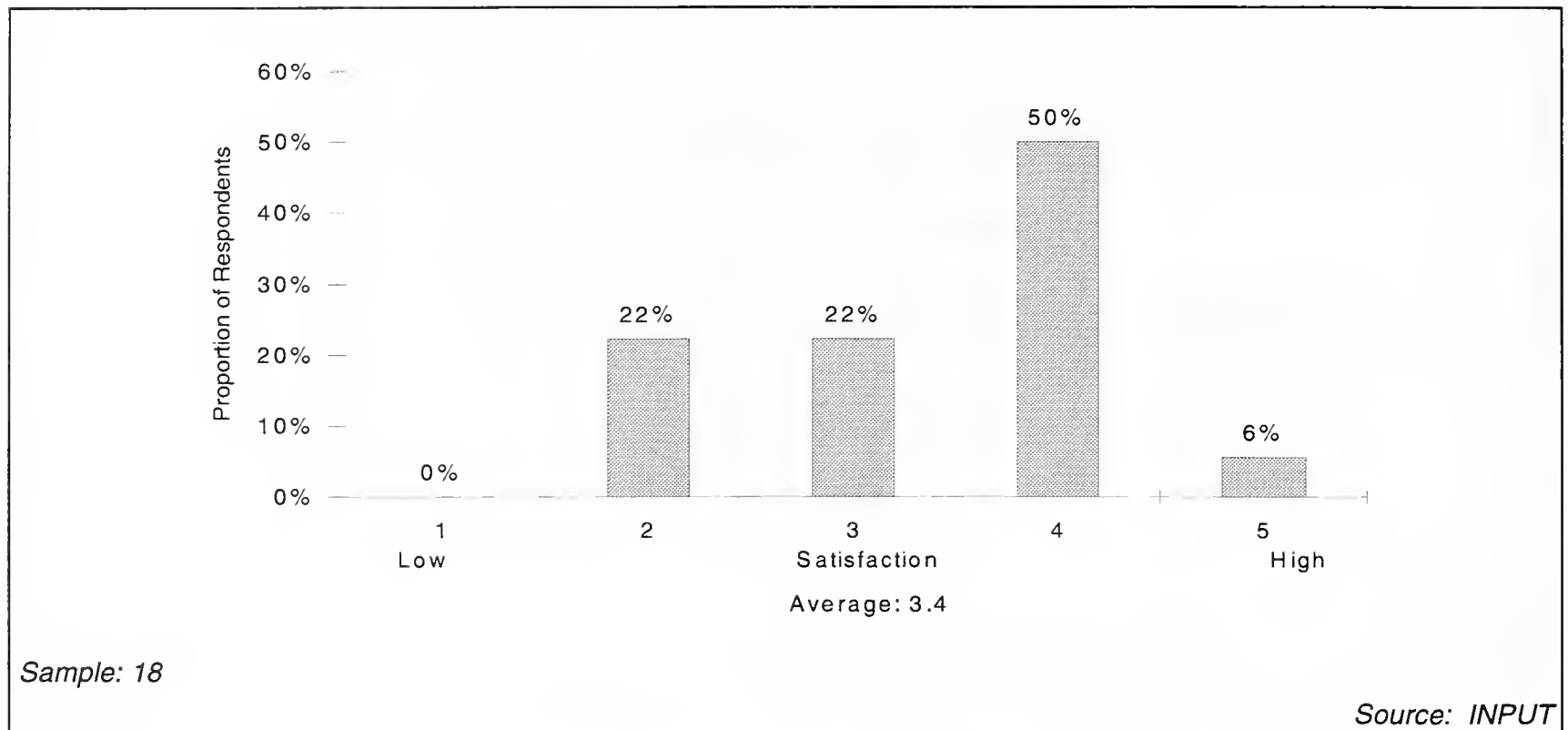
Exhibits X-5 to X-8 show the current and expected future importance of components of an ISP-provided Extranet service. As with Internet access services, reliability and national coverage are of prime importance.

Exhibit X-9 shows the difference between current and future importance. Again, as with Internet access, international coverage will increase greatly in importance, due largely to the expansion of network operations by US respondents overseas. Directory services will increase in importance, although they are considered of lesser importance currently. INPUT believes that directory services will become extremely important for large-scale Intranets connected via an Extranet. Ford Motor Company's is an example of a large-scale Extranet built on directory services, with 200,000 staff and resources stored.

Exhibit X-5

Current Importance of Extranet Service Characteristics, Worldwide

Characteristic	Importance
National coverage	4.8
Reliability/uptime	4.7
Remote Intranet access	4.2
Cost	3.9
Secure Internet tunnelling	3.8
Service level agreements	3.7
Access to messaging services	3.7
Remote other-LAN access	3.4
Access to directory services	3.1
Commerce capability	2.9
International coverage	2.2

1 Low   2   3 Importance   4   5 High
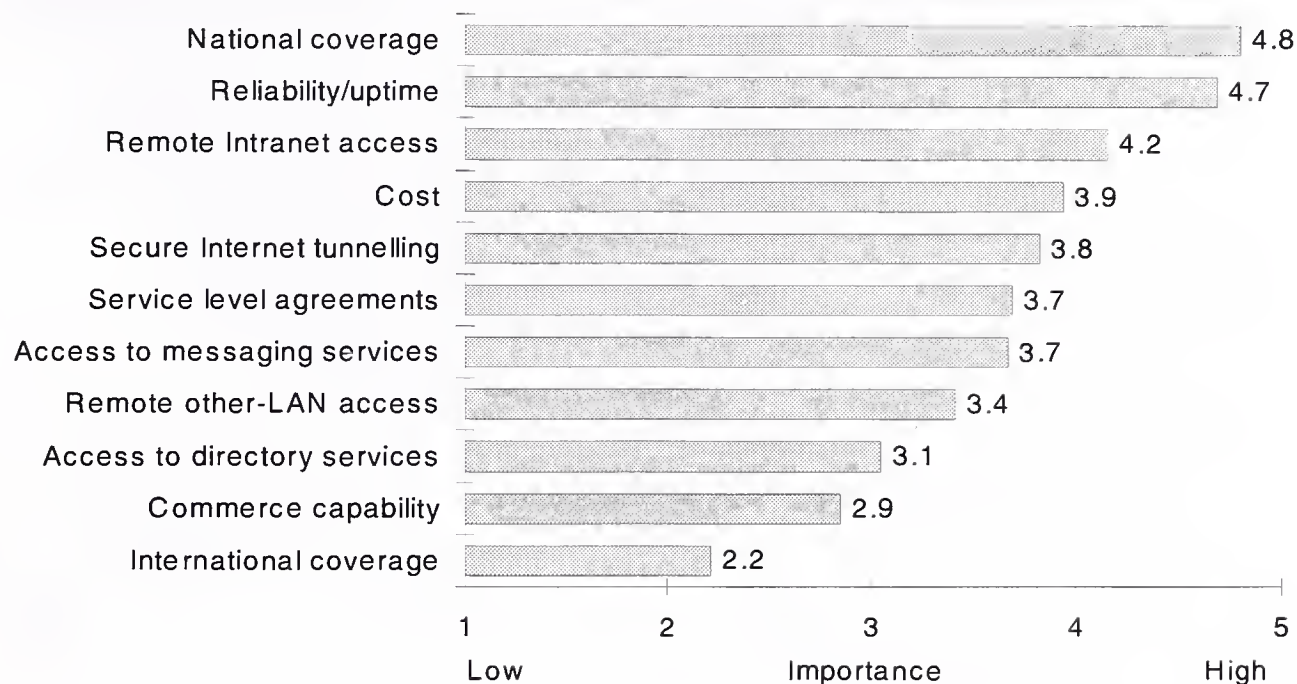
Sample: 20

Source: INPUT

Exhibit X-6

Expected Importance of Extranet Service Characteristics, 2000, Worldwide

Characteristic	Importance
National coverage	4.9
Reliability/uptime	4.8
Secure Internet tunnelling	4.2
Remote Intranet access	4.2
Cost	4.0
Access to messaging services	4.0
Access to directory services	3.7
Service level agreements	3.5
Commerce capability	3.3
Remote other-LAN access	3.2
International coverage	3.1

1 Low   2   3 Importance   4   5 High
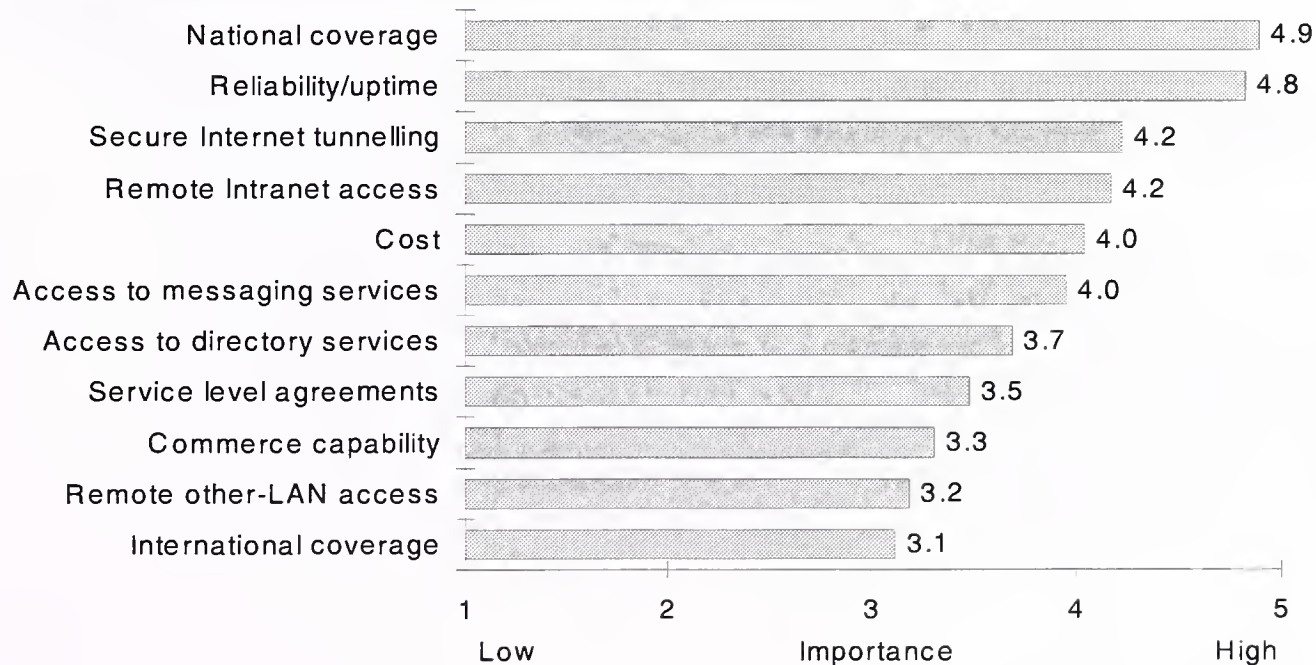
Sample: 48

Source: INPUT

Exhibit X-7

Expected Importance of Extranet Service Characteristics, 2000, US

Characteristic	Value
Reliability/uptime	4.9
National coverage	4.8
Remote Intranet access	4.6
Secure Internet tunnelling	4.6
Cost	4.3
Service level agreements	3.9
Access to messaging services	3.9
Access to directory services	3.9
Commerce capability	3.3
Remote other-LAN access	2.8
International coverage	2.3

Scale: 1 (Low) — 3 (Importance) — 5 (High)
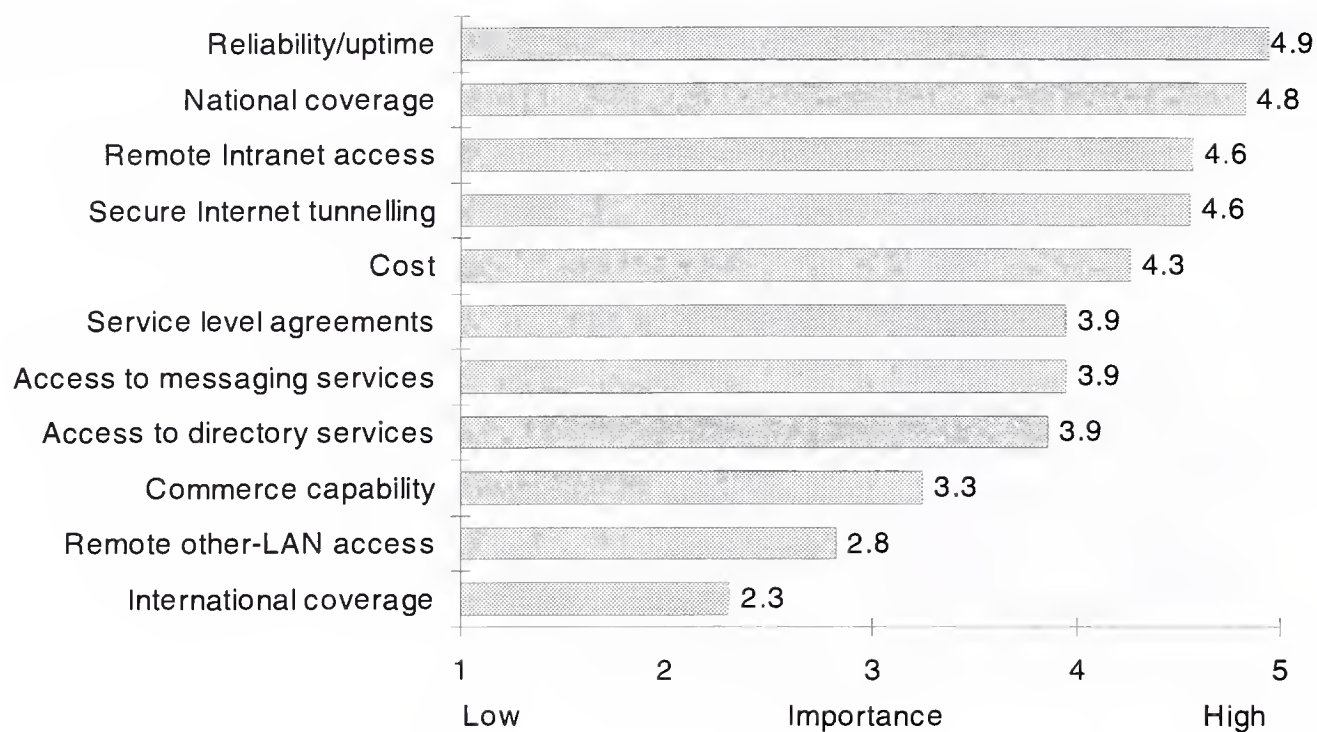
Sample: 21

Source: INPUT

Exhibit X-8

Expected Importance of Extranet Service Characteristics, 2000, Europe

Characteristic	Value
National coverage	4.9
Reliability/uptime	4.7
Secure Internet tunnelling	4.0
Access to messaging services	4.0
Cost	3.9
Remote Intranet access	3.8
International coverage	3.6
Access to directory services	3.6
Remote other-LAN access	3.4
Commerce capability	3.3
Service level agreements	3.1

Scale: 1 (Low) — 3 (Importance) — 5 (High)
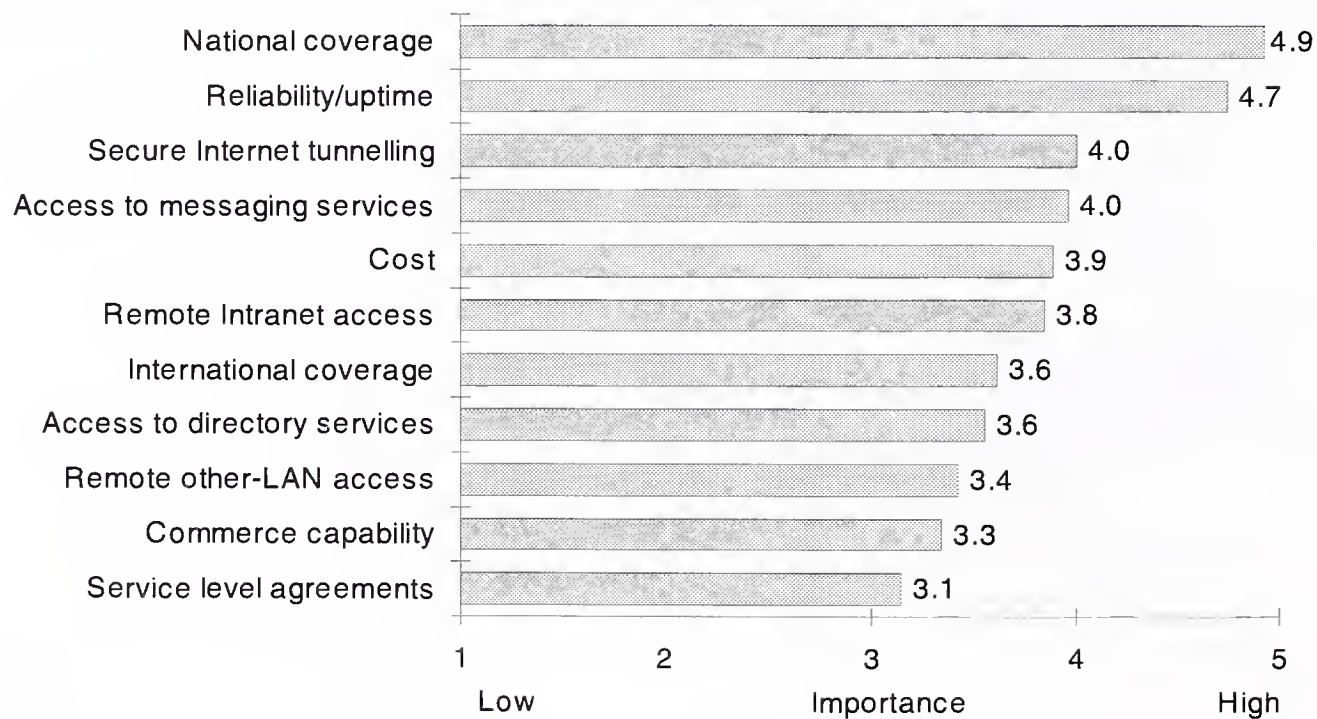
Sample: 27

Source: INPUT

Exhibit X-9

Expected Change in Importance of Extranet Service Characteristics, Worldwide

International coverage — 0.9
Access to directory services — 0.6
Commerce capability — 0.5
Secure Internet tunnelling — 0.4
Access to messaging services — 0.3
Reliability/uptime — 0.1
Cost — 0.1
National coverage — 0.1
Remote Intranet access — 0.0
Service level agreements — -0.2
Remote other-LAN access — -0.2

-0.4   -0.2   0.0   0.2   0.4   0.6   0.8   1.0

Expected Change in Importance
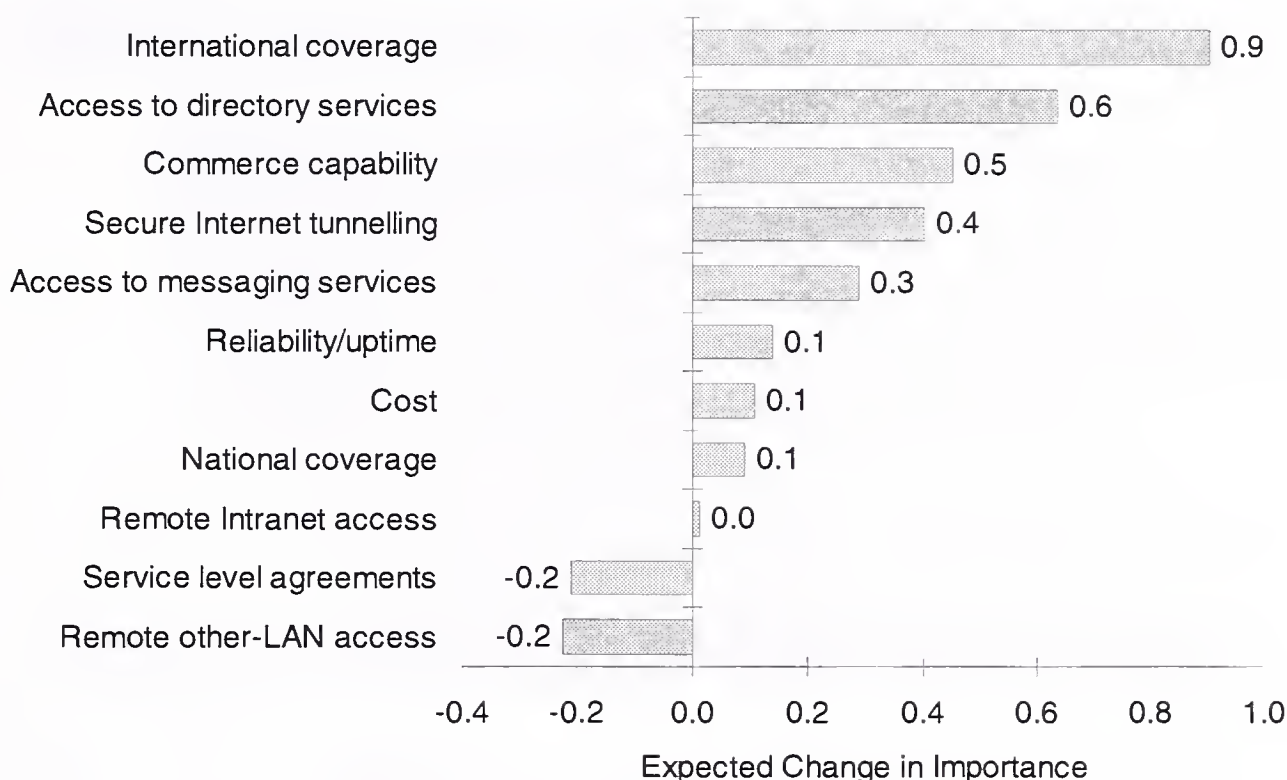
Sample: 48

Source: INPUT

Exhibit X-10 shows the satisfaction ratings given to each Extranet service component; Exhibit X-11 shows the difference between satisfaction rating and current importance of component.

The most important characteristics are rated reasonably well, but buyers are currently not satisfied with breadth of international coverage, the issue due to rise most in importance over the next two years.

As discussed above, many Extranet services are restricted to national markets, or are otherwise restricted according to the extent of an ISP's network. Buyers expect to roll out geographically widespread Extranets within the next two years and beyond, and ISPs should ensure suitable coverage. In many cases this will happen through acquisition, furthering ISP market consolidation.

Exhibit X-10

Satisfaction With Extranet Service Characteristics, Worldwide

Characteristic	Value
Reliability/uptime	4.2
National coverage	4.0
Access to directory services	3.9
Secure Internet tunnelling	3.8
Service level agreements	3.6
Commerce capability	3.5
Cost	3.5
Remote Intranet access	3.4
Access to messaging services	3.2
International coverage	3.1
Remote other-LAN access	3.1

1 — Low   2   3 — Importance   4   5 — High
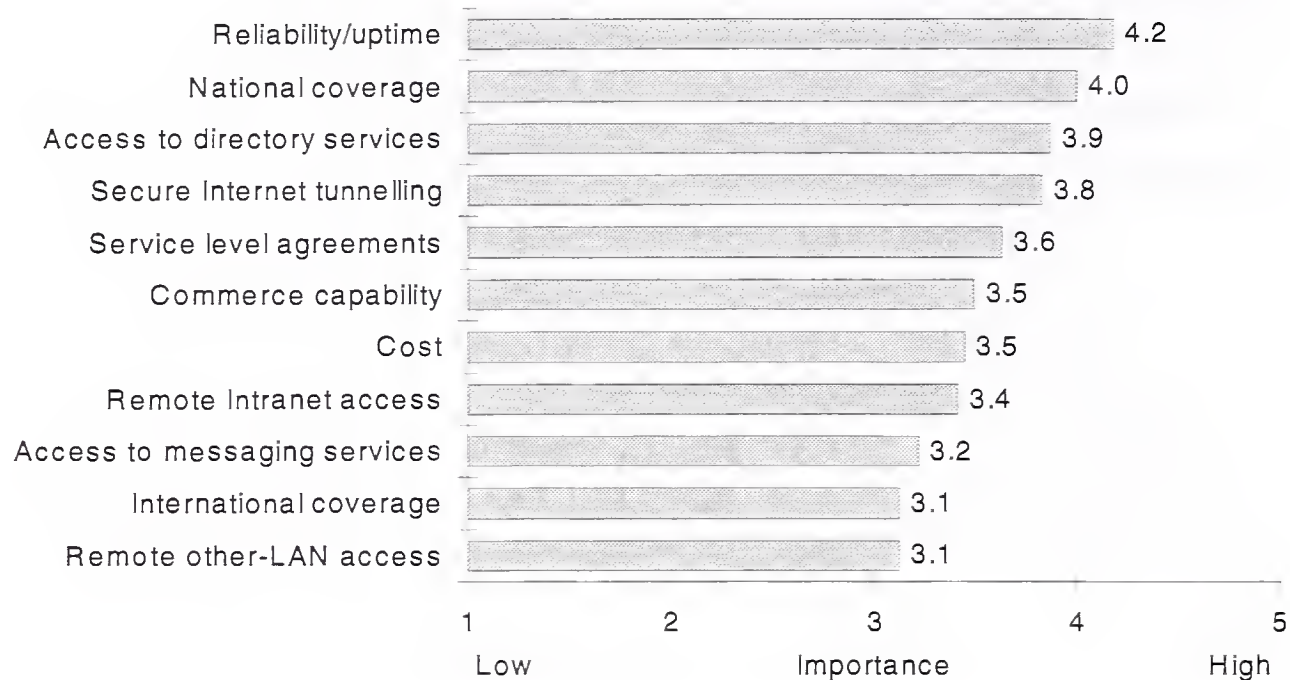
Sample: 12

Source: INPUT

Exhibit X-11

Difference Between Importance of and Satisfaction With Extranet Service Characteristics, Worldwide

Characteristic	Value
International coverage	0.9
Access to directory services	0.8
Commerce capability	0.6
Secure Internet tunnelling	0.0
Service level agreements	-0.1
Remote other-LAN access	-0.3
Access to messaging services	-0.4
Cost	-0.5
Reliability/uptime	-0.5
Remote Intranet access	-0.7
National coverage	-0.8

-1.0 — Worse   -0.5   0.0 — Satisfaction vs Importance   0.5   1.0 — Better

Sample: 20

Source: INPUT

124
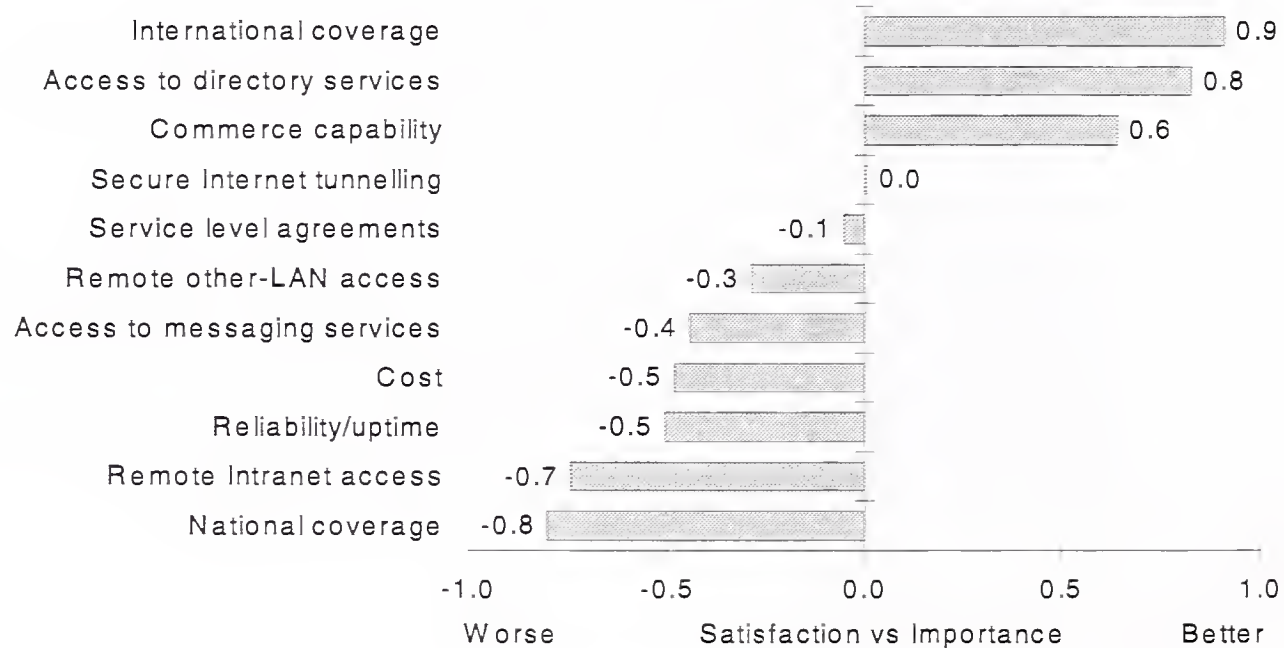
C
Purchasing Criteria

Exhibit X-12 shows the primary criteria used by buyers to purchase Extranet services. Security is a major concern but, surprisingly, issues of reliability and availability were stated by fewer respondents than expected. Unlike other ISP services discussed in this report, cost is a major factor in buyers' purchasing decisions. Extranet service pricing is currently high. As the market for Extranet services matures and more organizations make use of such services, Extranet capability will become a standard component of ISPs' corporate services.

Exhibit X-12

Criteria Used for Purchasing Extranet Services, Worldwide

Security — 32%
Cost — 23%
Reliability — 11%
Availability — 11%
Technical expertise — 7%
Performance — 5%
Experience — 5%
Ease of management — 5%

Proportion of Mentions
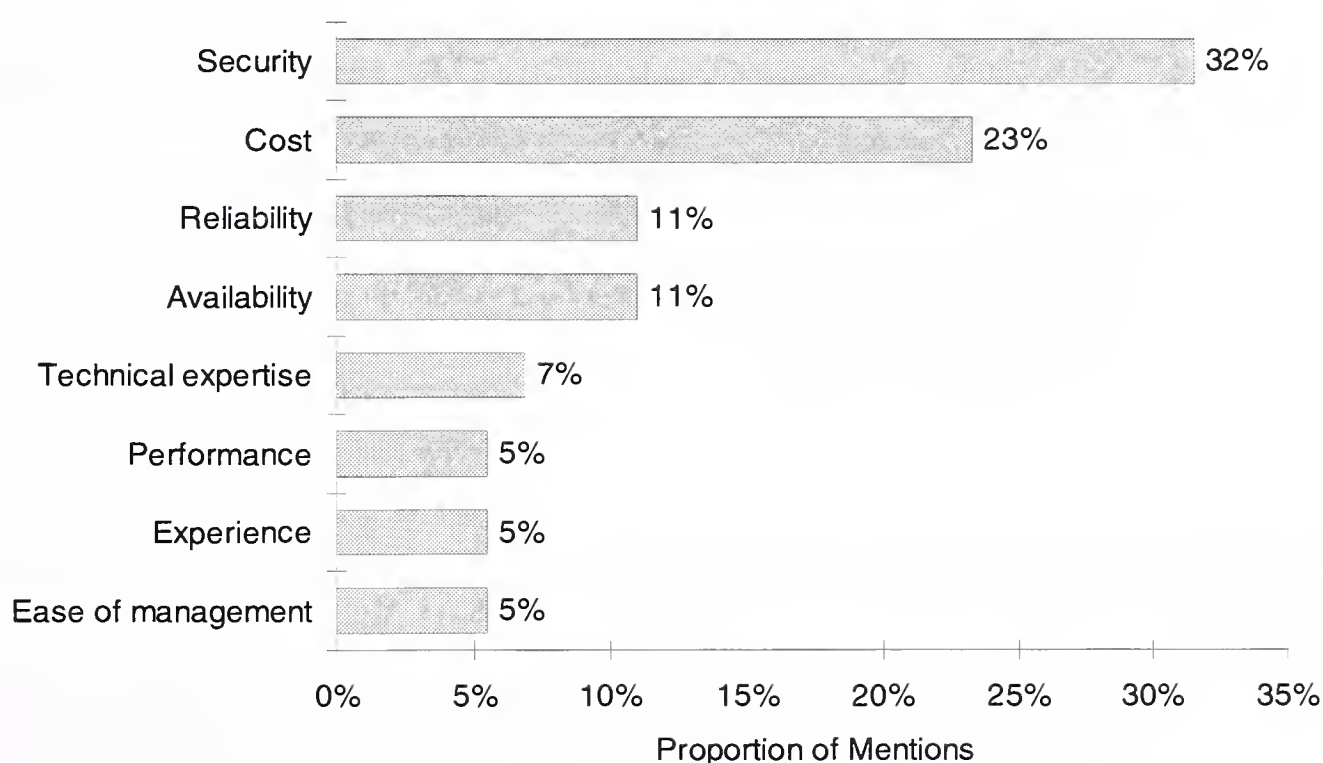
Sample: 73

Source: INPUT

Other criteria, mentioned by between one and three respondents, were:

- Breadth of services

- Commercial sensitivity

- Credibility

- Customer service

- Commerce capability

- Flexibility

- Functionality

- Geographical coverage

- Integration with an application hosting service

- ISP's stability

- Long term commitment from ISP

- Scalability

- Scope of service access (including partners and remote workers)

- Size of ISP's customer base

- Service level agreements

- Technical advice

D

Cost Savings

Respondents were asked to state what cost saving they had achieved, or expect to achieve, by replacing a proprietary, non-Internet VPN with an Internet-based Extranet. Exhibit X-13 shows cost savings expressed as a proportion of expenditure on an existing VPN.

Most buyers have achieved, or expect to achieve, cost savings of between 20% and 50%. Cost is a more important factor to buyers for Extranet services than for other ISP services, and is the second most important criterion for purchasing decisions. As shown above, Extranet service pricing will decrease as the market grows, and INPUT expects actual cost savings over existing VPNs to increase.

Exhibit X-13

Expected Extranet Cost Savings, Worldwide

Sample: 24

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A
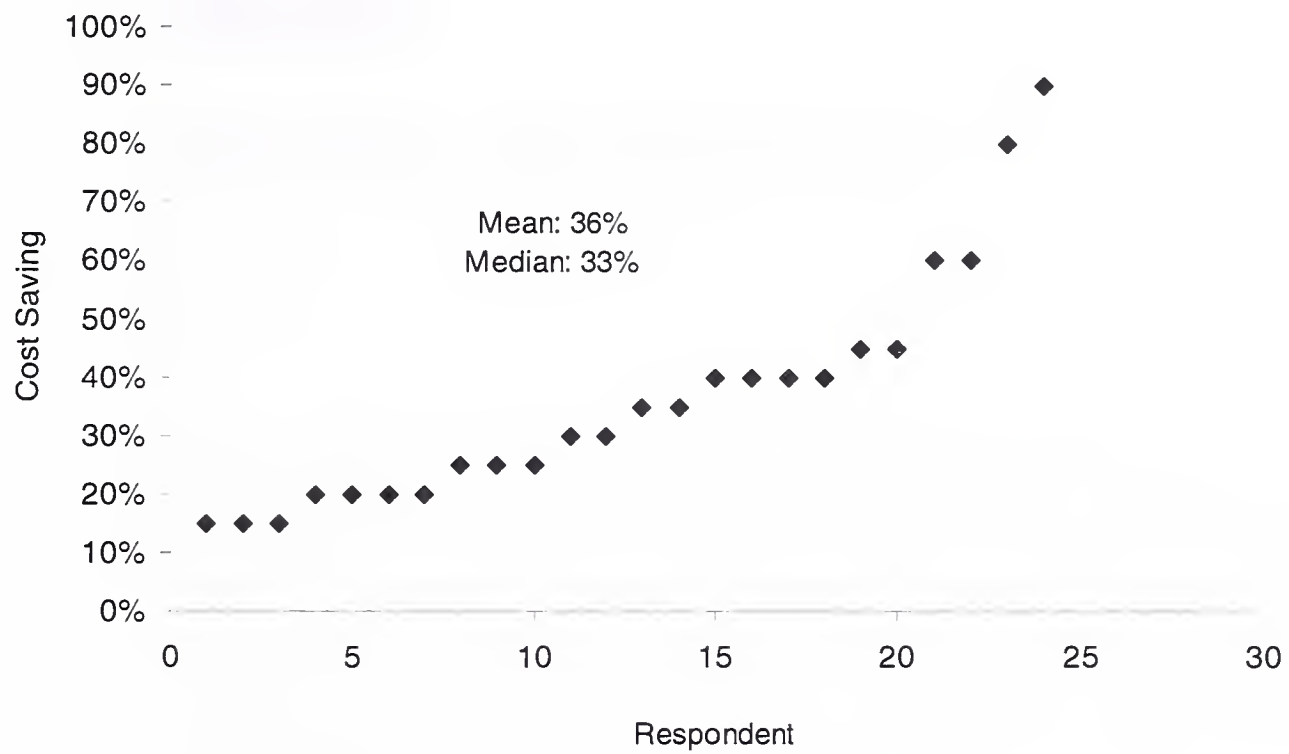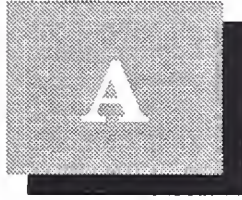
Vendor Awareness

This Appendix shows the visibility of individual ISPs in the four country markets covered in this report: the US, UK, France, and Germany. Respondents were asked which ISPs they recognized as being able to provide high-quality corporate Internet access and related hosting and Extranet services. The results reveal how successful providers have been in promoting their services to buyers in the finance, manufacturing, and retail industries.

A
US

Exhibit A-1

Vendor Awareness, US

Vendor	Proportion of Respondents
AT&T	85%
IBM / Advantis	72%
GTE / BBN	65%
ANS	64%
Worldcom	57%
Compuserve	56%
UUNET	55%
PSInet	40%
Netcom	37%
Concentric	37%
Infonet	23%
Concert	13%
Global One	12%
Cable & Wireless	9%
Equant	7%
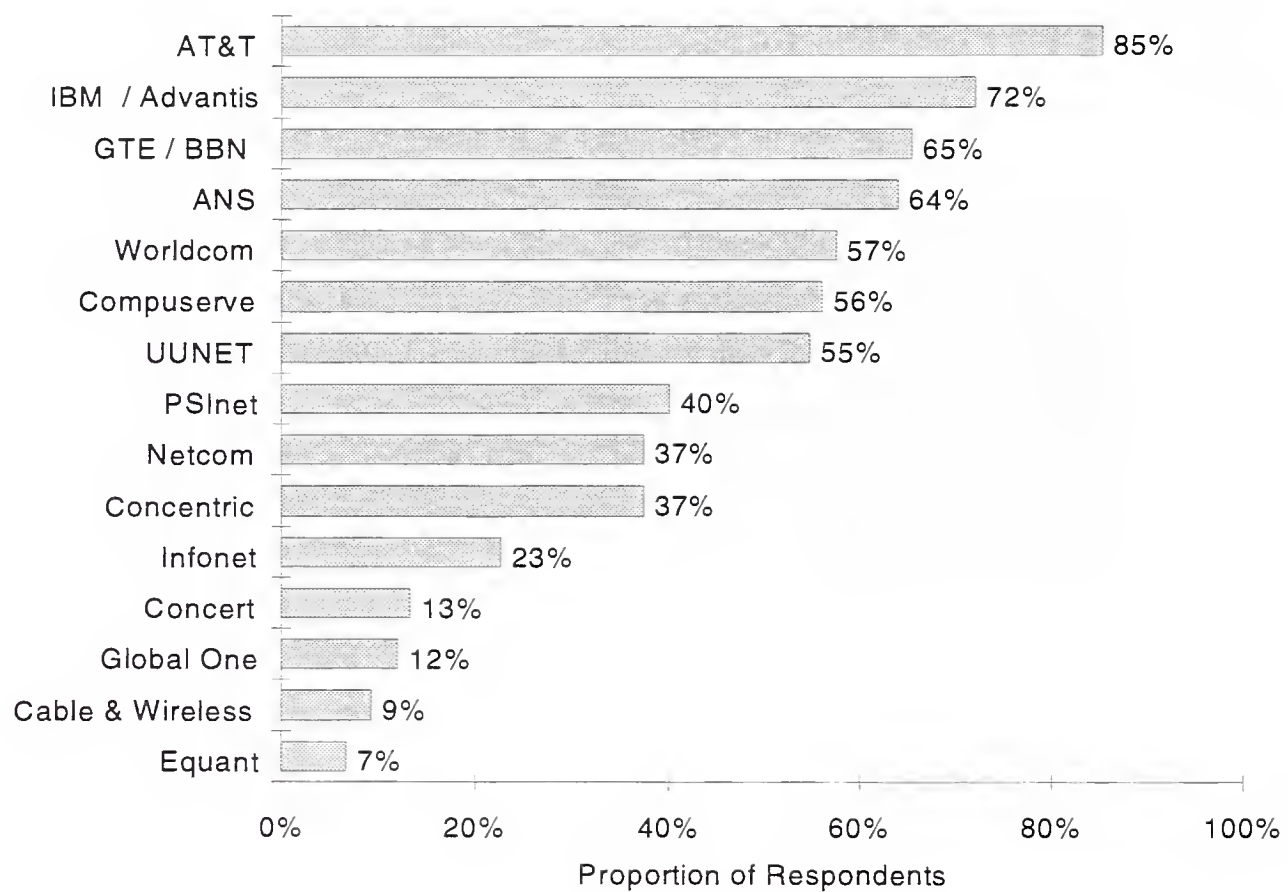
Sample: 75

Source: INPUT

B
UK

A-3

Exhibit A-2

Vendor Awareness, UK

IBM	88%
Compuserve	80%
BT	68%
AT&T	68%
Cable & Wireless	64%
UUNET/Pipex	52%
Demon	52%
Infonet	40%
EUnet	32%
PSInet	28%
Netcom	28%
Concert	20%

Proportion of Respondents
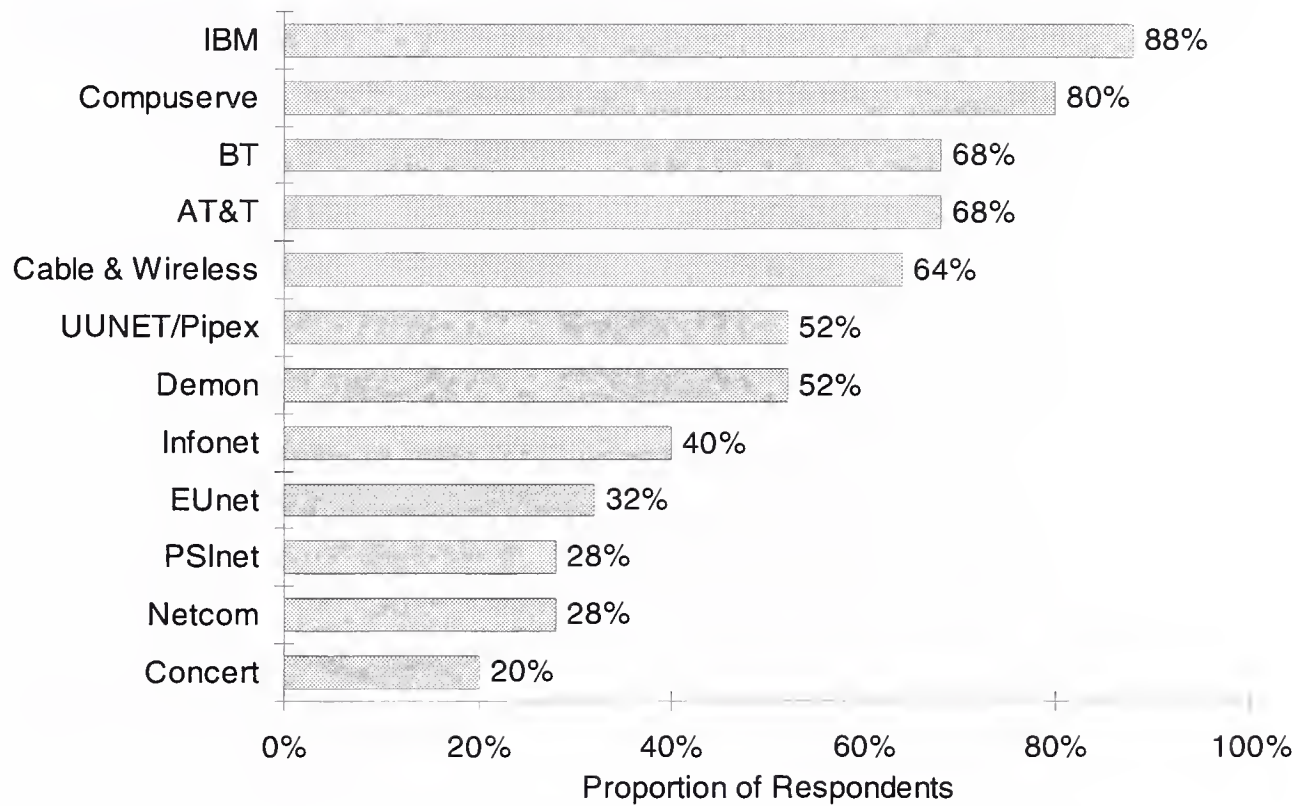
Sample: 25

Source: INPUT

C

France

Exhibit A-3

Vendor Awareness, France

Vendor	Proportion of Respondents
France Telecom Transpac	96%
IBM	84%
Compuserve	68%
Cegetel	68%
AT&T	68%
Infonet	48%
Global One	36%
EUnet	36%
UUNET	32%
Oleane	32%
Imaginet	28%
Cable & Wireless	28%
Internet-Way	24%
Netcom	8%
Internext	8%
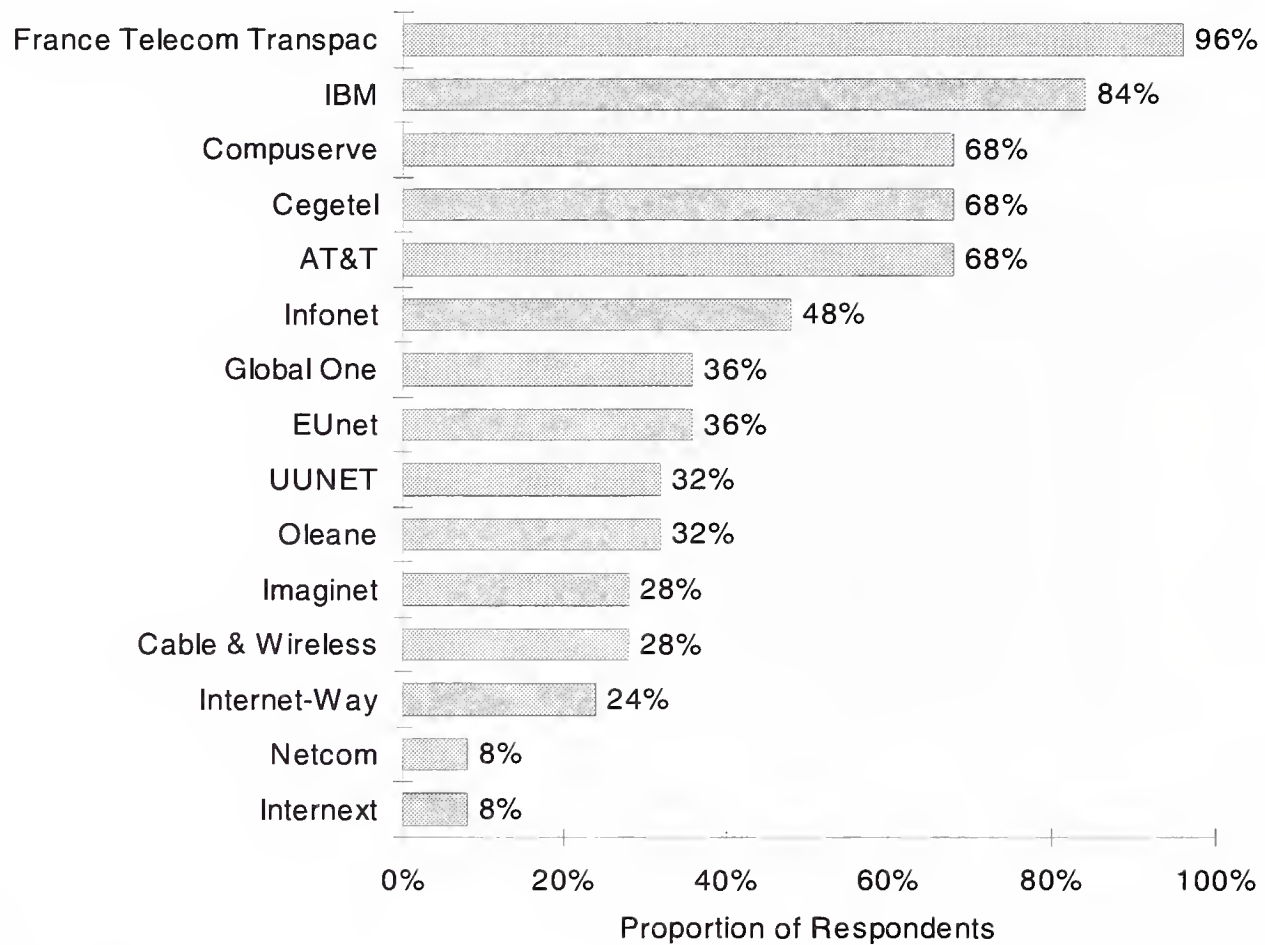
Sample: 25

Source: INPUT

D
Germany

A-5

Exhibit A-4

Vendor Awareness, Germany

Vendor	Proportion
Deutsche Telekom	84%
AT&T	80%
UUNET	72%
IBM	72%
Compuserve	72%
PSInet	40%
Netcom	36%
Infonet	36%
EUnet	32%
Global One	28%
Nacamar	24%
Cable & Wireless	20%
X-Link	12%

Proportion of Respondents
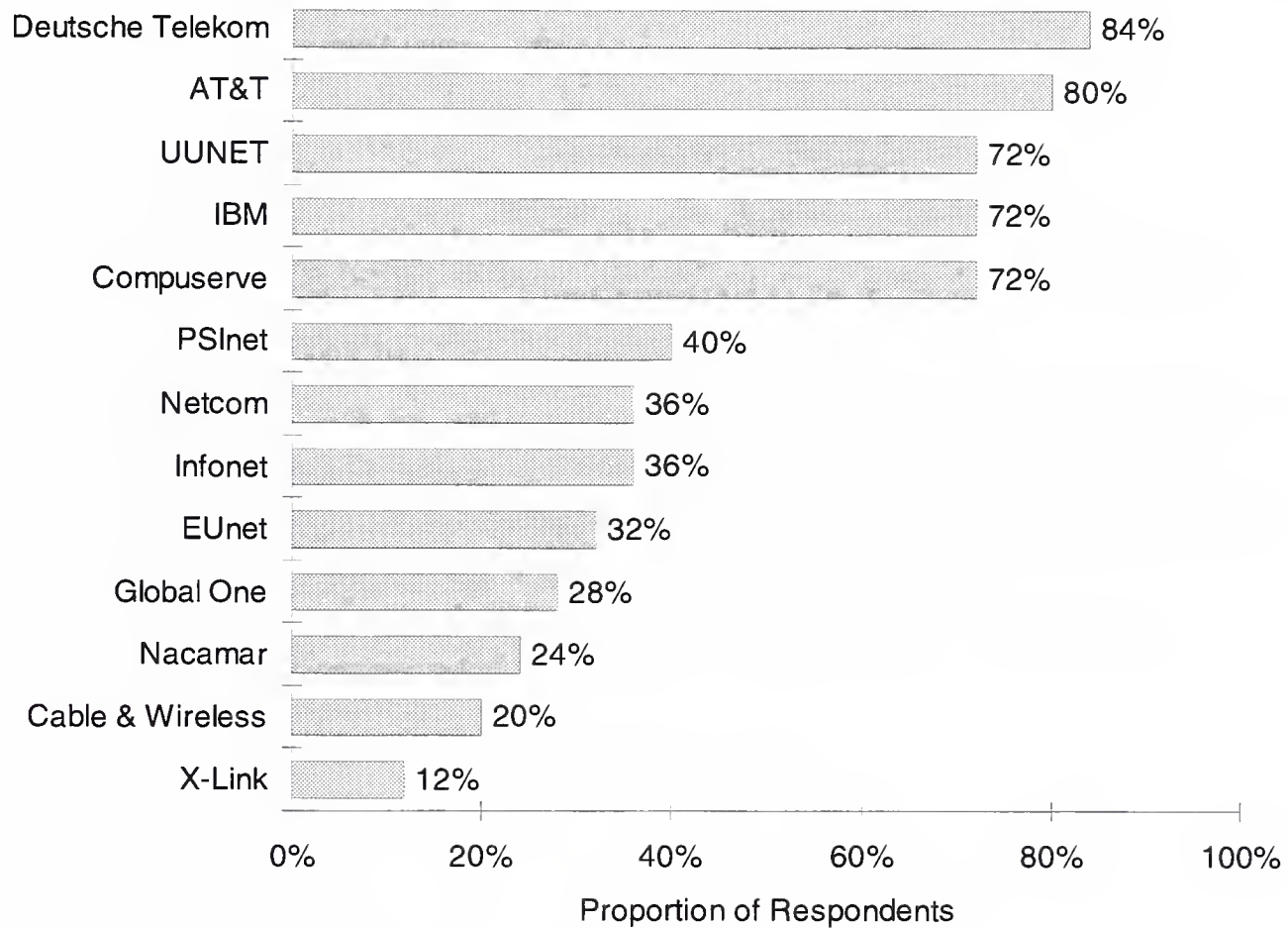
Sample: 25

Source: INPUT

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B
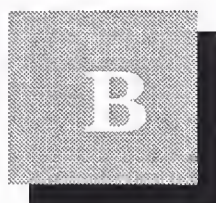
Buyer Questionnaire

This survey is to determine your satisfaction with, and improvements you would like in the provision of Internet access and hosting services.

In this survey, "ISP" is an Internet Service Provider. It can be a dedicated ISP (e.g. UUNET or Netcom), a telco (e.g. BT or AT&T), or a hybrid network services vendor (such as IBM Global Services or Infonet). This survey is concerned only with Internet-based services.

You will be provided with a copy of the results of this survey.

Are you the person who is most able to **evaluate the use of Internet services** on behalf of your organization? If not, to whom should I speak? (Close the interview and contact the specified person)

1. What Internet services do you currently use, and which do you expect to use within two years? **If respondent currently uses a service, then they must also use it in start-2000, unless they explicitly say they expect not to use that service at that time. E.g. Internet access will usually be ticked in both boxes.**

	Currently (start-98)	By start-2000
a. **Internet access**	[ ]	[ ]

Description: a service connecting your company to the Internet via a leased line, ISDN, etc.

b. **Public Web server hosting**	[ ]	[ ]

Description: your company's Web presence is on a server hosted by an ISP. You may rent Web space on a shared server, rent a dedicated server, or own the Web server

c. **Application / database server hosting**	[ ]	[ ]

Description: you rent or own a server (shared or dedicated) hosted by an ISP and used to run one or more applications or databases. May be for public or (more likely) private access. E.g.: your workgroup application or orders database.

d. **Extranet / Internet VPN services**	[ ]	[ ]

Description: a service that connects disperse offices and / or customers / suppliers / partners over the Internet and provides a secured virtual private network (or "tunnel") between them. Can be used for remote LAN access by mobile / home workers as well as for inter-office or inter-company communications. Must be Internet-based, not a private WAN or any non-Internet connection

If respondent does not currently have Internet access, terminate interview.

If respondent ticked fewer than three boxes out of the eight, terminate interview.

A. Characteristics

2. How many people are in your organisation in total?   _____

3. What proportion can use email over the Internet?   _____ %

4. What proportion have access to the World Wide Web?_____ %

5. Please estimate how much of your network traffic is purely internal and how much goes onto the Internet (count all traffic: incoming and outgoing)

	Currently (start-98)	In two years (start-2000)
a. Stays internal	_____ %	_____ %
b. Goes external	_____ %	_____ %

   must total 100%

   for each year

6. What proportion of your external traffic do you expect to be accounted for by Internet access via an ISP and how much by private WAN links? (Private WAN includes connections to proprietary EDI and other non-Internet network services)

	Currently (start-98)	In two years (start-2000)
a. Internet	_____ %	_____ %
b. Private WAN	_____ %	_____ %

    must total 100%

    for each year

B. Internet Access Services

<u>Current and Planned Usage</u>

7. Who is your primary ISP for corporate Internet access?

_____

8. Which other ISPs do you use, if any?

_____

_____

9. What is the total bandwidth between your company and your ISP(s)? (note: must record units, either Mbps (megabits per second) or Kbps (kilobits per second))

a. Currently   _____ (Kbps or Mbps?)

b. Expected in one year   _____ (Kbps or Mbps?)

c. Expected in two years   _____ (Kbps or Mbps?)

10. What level of uptime guarantee do you have from your ISP, and what level do you expect to require in two years' time? (Tick only one box per column)

	Currently (start-98)	By start-2000
a. 100%	[ ]	[ ]
b. 99.5% - 100%	[ ]	[ ]
c. 99.0 - 99.5%	[ ]	[ ]
d. 95% - 99%	[ ]	[ ]
e. Under 95%	[ ]	[ ]
f. No uptime guarantee	[ ]	[ ]
g. Don't know	[ ]	[ ]
h. Other (state)	_____	_____

(e.g. no more than 4 hours a month downtime)

11. What level of uptime do you typically achieve per month? (Tick only one)

a. 100%	[ ]
b. 99.5% - 100%	[ ]
c. 99.0 - 99.5%	[ ]
d. 95% - 99%	[ ]
e. Under 95%	[ ]
f. Other (state)	_____

(e.g. 8 hours a month downtime)

Satisfaction

12. Overall, how satisfied are you with your current Internet access service (1=unsatisfied, 5=very satisfied)

____

13. Please rate on a scale of 1 to 5 (1=unimportant, 5=critical) the current and future importance of the following Internet access issues. Please also rate your current satisfaction with your Internet access service (1=unsatisfied, 5=very satisfied)

	Importance now	Importance in two years	Current satisfaction
a. Reliability/uptime	____	____	____
b. Size of ISP's organisation	____	____	____
c. Provides only business services (not consumer)	____	____	____
d. Openness of information (e.g. publishes details of own network and peering agreements)	____	____	____
e. Cost	____	____	____
f. Service level agreements	____	____	____
g. Geographical coverage, national	____	____	____
h. Geographical coverage, international	____	____	____
i. Service continuity (e.g. redundant lines/equipment, backup power generators)	____	____	____

    j. ISP's commitment to improve/   ____   ____   ____
        upgrade service

    k. ISP's customer service   ____   ____   ____

    l. Backbone architecture   ____   ____   ____

14. In what ways could your Internet access service be improved?

_____

_____

Buying Process

15. Do you expect to change ISP over the next twelve months?

a. Yes   [ ]

b. No   [ ]

16. If yes, why?

a. _____

_____

And which ISP do you expect to change to (if known)?

b. _____

Costs

17. How are you currently billed for Internet access and which is your preferred billing method? (Tick only one box per column)

	Current	Preferred
a. Flat monthly/quarterly fee	[ ]	[ ]
b. Flat annual fee	[ ]	[ ]
c. By usage (traffic volume)	[ ]	[ ]

C. Hosting Services

Current and Planned Usage

18. Which of the following types of server do you currently host with an ISP, or expect to within two years? (Tick all that apply)

	Currently 2000	By start- (start-98)
a. Public Web server	[ ]	[ ]
b. Web commerce server	[ ]	[ ]
c. Private Intranet server	[ ]	[ ]
d. Application or database server	[ ]	[ ]

state application / database, e.g. Lotus Notes, SAP _____

_____

If respondent ticked any box for a or b, do section C.1 Web Hosting Services

If respondent ticked any box for c or d, do section C.2 Application/Database Hosting Services

C.1 Web Hosting Services

This section is only for services relating to ISP hosting of public Web servers (e.g. www.companyname.com).

19. What type of Web hosting service do you currently use, and which do you expect to use in two years' time? (Tick all that apply)

	Currently (start-98)	By start-2000
a. Shared	[ ]	[ ]
(you share a ISP's server with other customers)		
b. Dedicated	[ ]	[ ]
(you rent a whole ISP's server)		

c. Owned (aka co-located)   [ ]   [ ]
    (you own the server and the ISP hosts it)

20. For the servers hosted on your ISP's network, who performs the
    following (Tick only one per row)

	You, remotely via internet	You, on ISP's site	ISP
a. System management *(e.g. operating system upgrades)*	[ ]	[ ]	[ ]
b. Application management *(e.g. database configuration)*	[ ]	[ ]	[ ]
c. Content management *(e.g. database entry, Web site updates)*	[ ]	[ ]	[ ]
d. Routine physical operations *(e.g. maintenance, hardware upgrades)*	[ ]	[ ]	[ ]

21. For the same categories, which is most desirable to your
    company (Tick only one per row)

	You, remotely via internet	You, on ISP's site	ISP
a. System management *(e.g. operating system upgrades)*	[ ]	[ ]	[ ]
b. Application management *(e.g. database configuration)*	[ ]	[ ]	[ ]
c. Content management *(e.g. database entry, Web site updates)*	[ ]	[ ]	[ ]
d. Routine physical operations *(e.g. maintenance, hardware upgrades)*	[ ]	[ ]	[ ]

Benefits

22. How significant to your company are the following potential benefits of Web hosting services compared with in-house Web server provision (1=insignificant, 5=extremely significant). If you currently use hosting services, to what extent have those benefits been realised (1=not realised, 5=completely realised)

	Significance	Realisation
a. Cost saving	____	____
b. Reduce network traffic	____	____
c. Reduce internal IT management/admin	____	____
d. Stronger security	____	____
e. Swifter problem resolution	____	____
f. Increased functionality (eg commerce)	____	____
g. Increased resilience/redundancy	____	____
h. Other _____	____	____
i. Other _____	____	____
j. Other _____	____	____

Satisfaction

23. Overall, how satisfied are you with your current ISP's Web hosting services (1=unsatisfied, 5=very satisfied)

____

24. Please rate on a scale of 1 to 5 (1=unimportant, 5=critical) the current and future importance of the following Web server hosting issues. Please also rate your current satisfaction with your hosting service (1=unsatisfied, 5=very satisfied)

	Importance now	Importance in two years	Current satisfaction
a. Reliability/uptime	____	____	____
b. Cost	____	____	____
c. ISP's flexibility (responsiveness to changing requirements)	____	____	____
d. Service level agreements	____	____	____
e. Service continuity (e.g. redundant machines, hot disk swapping)	____	____	____
f. Physical security (security of machine and site)	____	____	____
g. Application/data security (e.g. authentication, firewall)	____	____	____
h. Bandwidth to/from server	____	____	____
i. ISP liability (ISP is liable for security breaches, etc.)	____	____	____
j. Server scalability/upgradability	____	____	____
k. Server mirror/replication	____	____	____

25. In what ways could your ISP's Web hosting service be improved?

_____

_____

Buying Process

26. Please list the most important criteria you use when seeking Web hosting services

_____

_____

27. Do you use the same provider for Web hosting as you do for corporate Internet access?

a. Yes   [ ]

b. No   [ ]

28. If no, why? Which ISP do you use for hosting?

_____

_____

Costs

29. If you have implemented a public Web server in-house, how much did it cost in total to set up (including all equipment, software and staff costs) and what are/were the ongoing annual costs (including leased line and staff costs)?

a. Setup costs   _____

b. Ongoing annual costs   _____

30. If you use Web hosting services, what are/were your setup and ongoing annual costs? (Cost saving will be assumed to be these costs minus in-house costs above.)

a. Setup costs   _____

b. Ongoing annual costs   _____

C.2 Application/Database Hosting Services

This section is only for services relating to ISP hosting of applications or databases - such as a Lotus Notes server or a private company database accessed by staff via the Internet. The application or database may be public or (more likely) private.

31. What type of application/database hosting service do you currently use, and which do you expect to use in two years' time? (Tick all that apply)

	Currently (start-98)	By start-2000
a. Shared *(you share a ISP's server with other customers)*	[ ]	[ ]
b. Dedicated *(you rent a whole ISP's server)*	[ ]	[ ]
c. Owned (aka co-located) *(you own the server and the ISP hosts it)*	[ ]	[ ]

32. For the servers hosted on your ISP's network, who performs the following (Tick only one per row)

	You, remotely via internet	You, on ISP's site	ISP
a. System management *(e.g. operating system upgrades)*	[ ]	[ ]	[ ]

b. Application management   [ ]   [ ]   [ ]
   (e.g. database configuration)

c. Content management   [ ]   [ ]   [ ]
   (e.g. database entry, Web site updates)

d. Routine physical operations   [ ]   [ ]   [ ]
   (e.g. maintenance, hardware upgrades)

33. For the same categories, which is most desirable to your company (Tick only one per row)

	You, remotely via internet	You, on ISP's site	ISP
a. System management *(e.g. operating system upgrades)*	[ ]	[ ]	[ ]
b. Application management *(e.g. database configuration)*	[ ]	[ ]	[ ]
c. Content management *(e.g. database entry, Web site updates)*	[ ]	[ ]	[ ]
d. Routine physical operations *(e.g. maintenance, hardware upgrades)*	[ ]	[ ]	[ ]

<u>Benefits</u>

34. How significant to your company are the following potential benefits of application/database hosting services compared with in-house server provision (1=insignificant, 5=extremely significant). If you currently use hosting services, to what extent have those benefits been realised (1=not realised, 5=completely realised)

	Significance	Realisation
a. Cost saving	____	____
b. Reduce network traffic	____	____
c. Reduce internal IT management/admin	____	____
d. Stronger security	____	____
e. Swifter problem resolution	____	____
f. Increased functionality (eg commerce)	____	____
g. Increased resilience/redundancy	____	____
h. Ability to share application with other offices	____	____
i. Other _____	____	____
j. Other _____	____	____
k. Other _____	____	____

Satisfaction

35. Overall, how satisfied are you with your current ISP's application/database hosting services (1=unsatisfied, 5=very satisfied)

____

36. Please rate on a scale of 1 to 5 (1=unimportant, 5=critical) the current and future importance of the following application/database server hosting issues. Please also rate your current satisfaction with your hosting service (1=unsatisfied, 5=very satisfied)

	Importance now	Importance in two years	Current satisfaction
a. Reliability/uptime	____	____	____
b. Cost	____	____	____
c. ISP's flexibility (responsiveness to changing requirements)	____	____	____

d. Service level agreements   ____   ____   ____

e. Service continuity   ____   ____   ____
   (e.g. redundant machines, hot disk swapping)

f. Physical security   ____   ____   ____
   (security of machine and site)

g. Application/data security   ____   ____   ____
   (e.g. authentication, firewall)

h. Bandwidth to/from server   ____   ____   ____

i. ISP liability   ____   ____   ____
   (ISP is liable for security breaches, etc.)

j. Server scalability/upgradability   ____   ____   ____

k. Server mirror/replication   ____   ____   ____

37. In what ways could your ISP's application/database hosting service be improved?

_____

_____

Buying Process

38. Please list the most important criteria you use when seeking application/database hosting services

_____

_____

39. Do you use the same provider for application/database hosting as you do for corporate Internet access?

a. Yes   [ ]

b. No   [ ]

40. If no, why? Which ISP do you use for hosting?

_____

_____

Costs

41. If you have used application/database hosting services, how much did (or would) the same application cost to set up and run in-house? How much does it cost to run the application using an ISP hosting service? Include all related hardware, software, labour and communications costs.

In-house:

a. Setup costs   _____

b. Ongoing annual costs   _____

ISP Hosting Service:

a. Setup costs   _____

b. Ongoing annual costs   _____

D. Extranet / VPN Services

Current and Planned Usage

42. If you have an Internet-based Extranet/VPN service, what does/will it include now and in two years' time? (Tick all that apply)

	Currently (start-98)	By start-2000
a. Secure Internet tunnelling	[ ]	[ ]
b. Access to corporate messaging services	[ ]	[ ]
c. Access to corporate directory services	[ ]	[ ]

d. Remote Intranet access   [ ]   [ ]

e. Remote non-Intranet LAN access   [ ]   [ ]

f. Commerce capability   [ ]   [ ]

43. If you have not implemented, or do not intend to implement an Internet-based Extranet/VPN, why not? (Tick all that apply)

a. Too expensive   [ ]

b. No need for any kind of Extranet/VPN   [ ]

c. Satisfied with existing non-Internet VPN   [ ]

d. Security concerns   [ ]

e. No suitable services available   [ ]

f. Market is immature   [ ]

g. Haven't considered it yet   [ ]

h. Other (state) _____

44. What is, or would be the most appropriate method of implementing Extranets/VPNs within your company, now and in two years' time (Tick only one per column)

	Currently (start-98)	By start-2000
a. Use non-Internet carrier service	[ ]	[ ]
b. Use Internet-based ISP service	[ ]	[ ]
c. Implement yourself using off-the-shelf products	[ ]	[ ]
d. Implement yourself using inhouse-developed products	[ ]	[ ]

45. Which of the following do you currently, or plan to, include in a Internet-based Extranet/VPN (Tick all that apply - if respondent ticks a category for 1998, it must also be ticked for 2000, unless respondent states otherwise)

	Currently (start-98)	By start-2000
Corporate headquarters	[ ]	[ ]
Branch offices	[ ]	[ ]
Remote users (mobile/home workers)	[ ]	[ ]
Business partners	[ ]	[ ]
Suppliers	[ ]	[ ]
Customers	[ ]	[ ]

Benefits

46. How significant to your company are the following potential benefits of an Internet-based VPN/Extranet (1=insignificant, 5=extremely significant). If you have implemented already, to what extent have those benefits been realised (1=not realised, 5=completely realised)

	Significance	Realisation
a. Cut existing costs	____	____
b. Replace existing intra-company WAN	____	____
c. Replace existing non-Internet VPN service	____	____
d. Extend (not replace) current network at low cost	____	____
e. Enable new business methods (e.g. electronic commerce, remote working)	____	____
f. Other _____	____	____
g. Other _____	____	____
h. Other _____	____	____

Satisfaction

47. Overall, how satisfied are you with your ISP's Internet-based Extranet/VPN service (1=unsatisfied, 5=very satisfied) (if applicable)

____

48. In relation to Internet-based Extranet/VPN services, how important are the following issues to your company (1=unimportant, 5=critical), now and in two years. If you already have such a service, how satisfied are you with each issue (1=not satisfied, 5=highly satisfied)

	Importance now	Importance in two years	Current satisfaction
a. Secure Internet tunnelling	____	____	____
b. Access to messaging services	____	____	____
c. Access to directory services	____	____	____
d. Remote Intranet access	____	____	____
e. Remote non-Intranet LAN access	____	____	____
f. Commerce capability	____	____	____
g. Geographical coverage, national	____	____	____
h. Geographical coverage, international	____	____	____
i. Cost	____	____	____
j. Reliability/uptime	____	____	____
k. Service level agreements	____	____	____

49. In what ways could your Internet-based Extranet/VPN service be improved (if applicable)?

_____

_____

Buying Process

50. Please list the most important criteria you use or would use when seeking Internet-based Extranet/VPN services

_____

_____

51. Do, or would, you use the same provider for Internet-based Extranet/VPN services as you do for corporate Internet access?

a. Yes   [ ]

b. No   [ ]

52. If no, why? Which ISP do you use for Extranet/VPN services (if applicable)?

_____

_____

Costs

53. If you use Internet-based Extranet/VPN services, what are/were your setup and ongoing annual costs (including equipment and ongoing charges)?

a. Setup costs   _____

b. Ongoing annual costs   _____

54. If you have implemented a VPN over a private WAN, what are/were your setup and ongoing annual costs?

a. Setup costs   _____

b. Ongoing annual costs   _____

55. If you use a non-Internet VPN service (provided by a telco, EDI, or other non-Internet provider), what are/were your setup and ongoing annual costs?

a. Setup costs _____

b. Ongoing annual costs _____

56. Overall, what cost saving have you, or do you expect you could achieve by replacing your non-Internet VPN with an Internet-based Extranet/VPN? (state as percentage)

_____ %

E. Vendor Awareness

57. How well do you perceive the following ISPs are able to provide high-quality corporate Internet access and related services such as Web hosting and Extranet services (1=poorly able, 5=highly able)

If respondent is not aware of a vendor's services, state "N"

Use the relevant country list

US

a. ANS ____

b. AT&T ____

c. Cable & Wireless ____

d. Compuserve ____

e. Concentric ____

f. Concert ____

g. Equant ____

h. Global One ____

i. GTE Internetworking / BBN ____

j. IBM / Advantis ____

k. Infonet ____

l. Netcom ____

m. PSInet   ____

n. UUNET   ____

o. Worldcom   ____

UK

a. AT&T   ____

b. BT   ____

c. Cable & Wireless   ____

d. Compuserve   ____

e. Concert   ____

f. Demon Internet   ____

g. EUnet   ____

h. IBM   ____

i. Infonet   ____

j. Netcom   ____

k. PSInet   ____

l. UUNET/Pipex   ____

France

a. AT&T   ____

b. Cable & Wireless   ____

c. Cegetel   ____

d. Compuserve   ____

e. EUnet _____

f. France Telecom Transpac _____

g. Global One _____

h. Imaginet _____

i. IBM _____

j. Infonet _____

k. Internet-Way _____

l. Internext _____

m. Netcom _____

n. Oleane _____

o. PSInet _____

p. UUNET _____

Germany

a. AT&T _____

b. Cable & Wireless _____

c. Compuserve _____

d. Deutsche Telekom _____

e. EUnet _____

f. Global One _____

g. IBM _____

h. Infonet _____

i. Netcom _____

j. PSInet _____

k. UUNET ____

l. X-Link ____

m. NACAMAR ____

F. Budgets

58. Please estimate your company's annual expenditure on the following.

	Currently (start-98)	By start-2000
a. Total IT budget		
b. Internet access		
c. Hosting services		
d. Internet-based Extranet/VPN services		

Thank you for your time and consideration.

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